22

iii

FIFTY YEARS' REPUTATION

Hunyadi János

Natural Aperient Water

has now been prescribed by Practitioners of all countries for nearly half a century, and their unanimity concerning its supreme excellence is strikingly displayed in the emphatic verdict of approval which has been returned by Doctors the world over.

When we find men of such undisputed eminence in their several lines as *Professor Virchow; Professor Moleschott,* of Rome; *Professor von Esmarch,* of Kiel; *Professor Lombroso,* of Turin; *Dr. Chas. Fauvel,* of Paris; *Professor Fred. T. Roberts, Dr. Lewis A. Sayre,* of New York; *Professor Wm. A. Hammond,* late Surg.-Gen. of the United States Army; *Professor von Bamberger,* of Vienna; *Professor Vanlair,* of Liege, referring to HUNYADI JANOS in warm and even enthusiastic terms, nothing more is needed to show that, in point of medicinal qualities, it must be something quite out of the common.

PROPRIETOR OF THE SPRINGS—

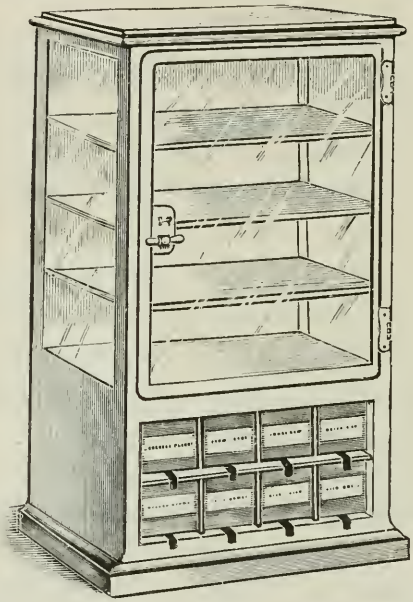
ANDREAS SAXLEHNER, BUDAPEST.

Samples and Literature Free to Medical Men on application to the

LONDON Agency: Trafalgar Buildings, Charing Cross, W.C.

SUMNER'S
Combined Instrument and Dressing Cabinet.

34 inches high, 18 inches wide, 11 inches deep.
A most useful and ornamental piece of furniture for Surgery or Consulting Room.



PRICE, including Dressings, etc., £5 nett.

PRICE, including Dressings, etc., £5 nett.

The upper portion is a well-made white enamelled cupboard, with glass front and sides, three glass shelves, plated lock and hinges.

The base or lower portion is of metal, and is divided into eight compartments to hold boxes of Dressings, &c. The boxes are dust-proof, and made of strong cardboard, to which tapes are attached to facilitate their removal from the pigeon holes.

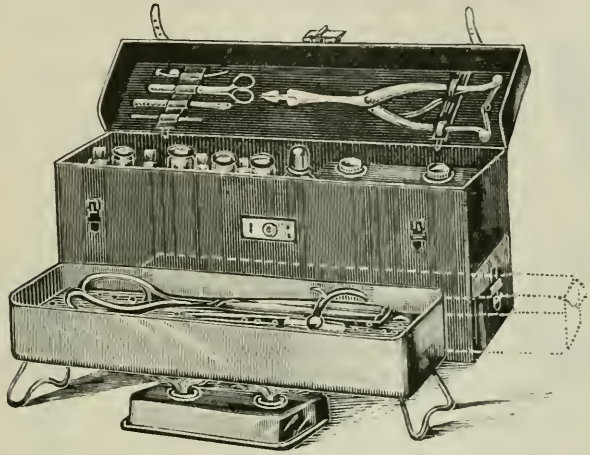
The Dressings usually supplied are Boric Wool, Cyanide Gauze, Alembroth Wool, Bandages, Muslinette (Waterproof Material) Absorbent Gauze, Absorbent Lint, and Adhesive Plaster on reels, but of course these can be varied as desired.

When Dressings are exhausted, they can be replaced, if wished, in new cardboard boxes at a trivial cost.

R. SUMNER & CO., LTD., LIVERPOOL.

Modern and Improved

MIDWIFERY BAG WITH STERILIZER.



The bag is made of cowhide (either black or brown) and has a compartment beneath into which the Sterilizer fits.

The Sterilizer has no seams, being blocked out in one piece from a solid metal sheet and heavily nickel plated.

The larger instruments are carried in Sterilizer, the top portion of the bag being reserved for Nail Brush, Lamp, Chloroform Bottle, Pill and Medicine Bottles, Dredger, leaving room for Apron, Gloves, &c.

The inside Cover has loops arranged for carrying the smaller instruments.

PRICE of the Bag, together with Sterilizer, Lamp, Nail Brush in plated case, Minim measure in case, Chloroform Bottle in plated case, Dredger, 3 Pill Bottles, 3 Medicine Bottles.

£3 3 0 net (or £3 13 6 if of solid leather throughout.)

An outside Canvas Cover can be supplied at 7/6 extra.

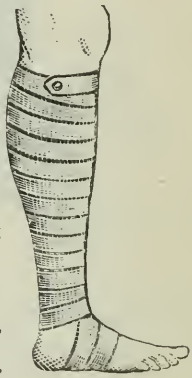
R. SUMNER & CO., Ltd.,

SURGICAL INSTRUMENT MAKERS, LIVERPOOL.

THE "PUTTEE" LEG BANDAGE

FOR VARICOSE VEINS, etc.

THESE are elastic Bandages fitted with a loop for the foot, and fastened at the top with patent spring fasteners.



The advantage is that the bandages are quickly adjusted, and always keep in position.

They are preferable to an Elastic Stocking as they can be adapted to any required pressure, and are cooler and lighter in weight.

They require no measurements or fitting, and are only about half the price of stockings.

WE MAKE IN TWO SIZES.

To reach the Knee (9 feet by 2½ inches), 2/- each.

To reach the Thigh (13½ feet by 2½ inches), 3/- each.

SPECIAL SIZES MADE TO ORDER.

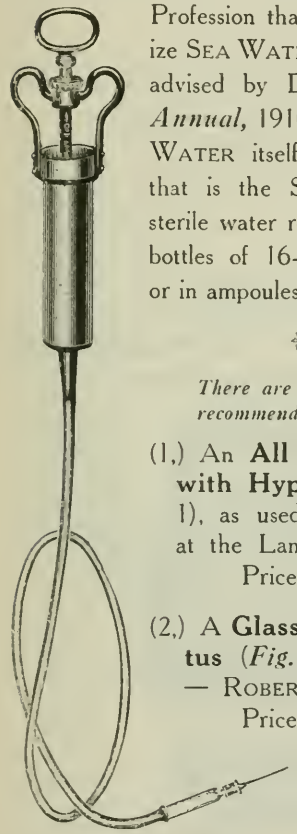
R. SUMNER & CO., LTD., LIVERPOOL.

STERILE SEA WATER

FOR INJECTION.

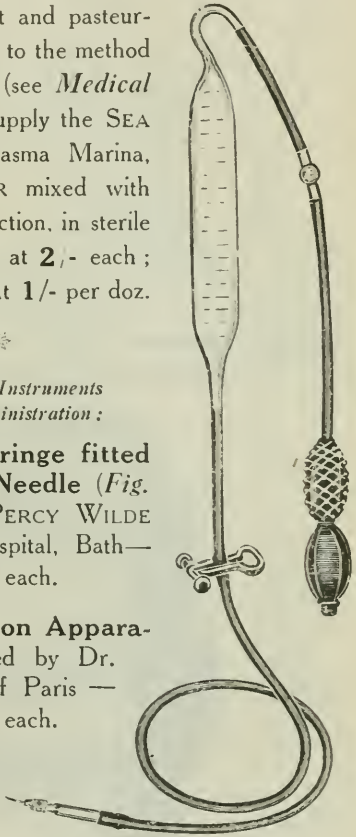
MESSRS. R. SUMNER & CO. LTD., LIVERPOOL,

Fig. 1.



beg to inform Members of the Medical Profession that they collect and pasteurize SEA WATER according to the method advised by Dr. SIMON (see *Medical Annual,* 1910). They supply the SEA WATER itself, or the Plasma Marina, that is the SEA WATER mixed with sterile water ready for injection, in sterile bottles of 16-oz. capacity at **2/-** each; or in ampoules of 50 c.c. at **1/-** per doz.

Fig. 2.



There are two kinds of Instruments recommended for its administration:

(1.) An **All Metal Syringe fitted with Hypodermic Needle** (*Fig.* 1), as used by Dr. PERCY WILDE at the Lansdowne Hospital, Bath—
Price - **15/-** each.

(2.) A **Glass Gravitation Apparatus** (*Fig.* 2), as used by Dr. — ROBERT SIMON, of Paris —
Price - **12/-** each.

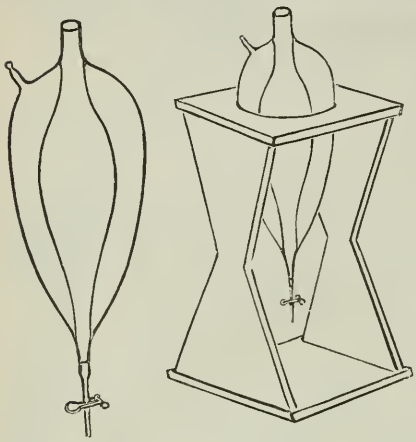
Instrument used by Dr. Percy Wilde.

Instrument used by Dr. Robert Simon.

In addition to these Instruments, a **100 c.c. Measure Glass** —— will be found useful, the price of which is **1/6.** ——

R. SUMNER & Co. Ltd. LIVERPOOL

APPARATUS FOR THE INTRAVENOUS ADMINISTRATION OF "SALVARSAN."



The difficulty of keeping the solution at an even temperature during administration, led Mr. Arthur J. Evans, F.R.C.S. Edin., Hon. Surg. Liverpool Stanley Hospital, to design a flask on the Dewar principle, which has proved very successful.

The inner portion has a capacity of 500 C.C. and is separated from the outer by a vacuum.

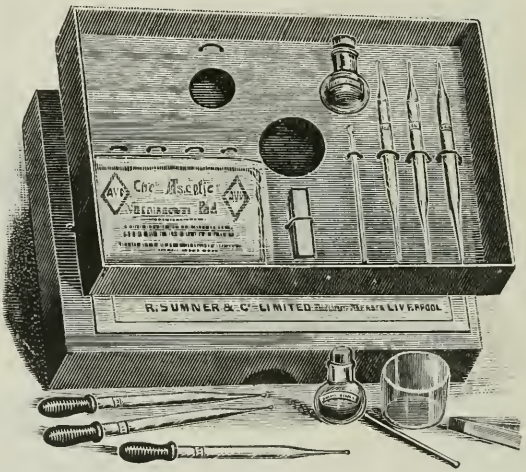
Warm fluid allowed to stand in the flask loses only 3°F in half-an-hour, so that in the ordinary time taken to administer the drug, only 1°F is lost.

The apparatus is well adapted for any purpose in which it is necessary to introduce warm fluids into the body, via the veins, tissues, or rectum, without the cumbrous method of keeping the solution warm by means of spirit lamps, water baths, &c.

PRICE (including stand, tubing, clip and special needle designed for direct introduction into the vein without making an incision) **25/-**

Ready prepared Sterile Reagents for the Preparation of Salvarsan for Intra-Muscular Injection.

These Reagents enable a Practitioner to prepare the injection at the Bedside, with great ease and simplicity.



Each Case contains two sets of Reagents, with the necessary apparatus, sufficient for two Injections.
PRICE **5/-** per case.

Fullest Instructions for Preparing and Injecting given with each Case.

A 20 c.c. "RECORD" SERUM SYRINGE is considered the best for administration; the price of this with Two Needles of proper calibre is **17/6**

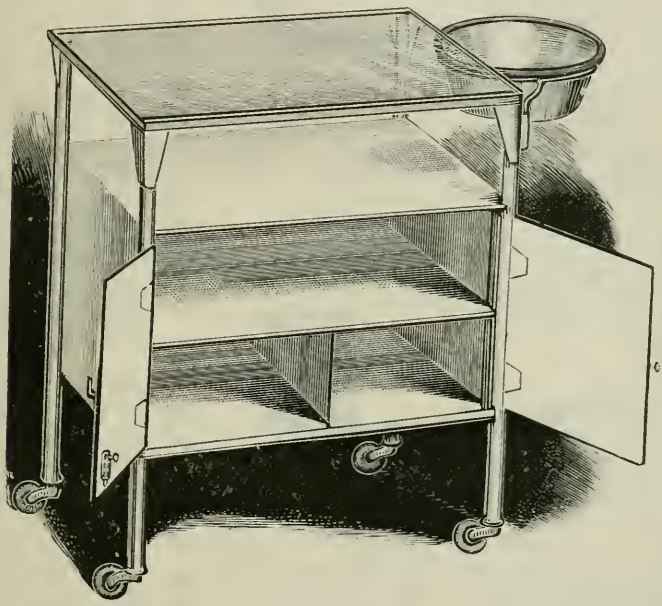
SALVARSAN **"606"** in tube sufficient for One dose - **10/-** per tube.

R. SUMNER & CO., LTD., LIVERPOOL.

ASEPTIC
DRESSING TABLE & CABINET

THIS table is made from the best cold drawn steel tubes, and japanned with white enamel in stoves at a temperature that renders the surface hard and lasting.

THE PRICE IS EXCEEDINGLY MODERATE.



Price £3 3s.

Measurements of Table:—Height 32 in. ; Width 22 in. ; Depth 17 in.
Measurements of Cabinet :—Height 13 in. ; Width 22 in. ; Depth 17 in.

The top is plate glass, the underneath shelf and cabinet are made of metal. It is provided with a bowl for antiseptic solutions, and is mounted on rubber wheels. It is an ornamental, useful and much desired addition to any surgery or consulting room.

R. SUMNER & Co., Ltd.,
Surgical Instrument Makers,
LIVERPOOL.

R. SUMNER & Co. Ltd. LIVERPOOL

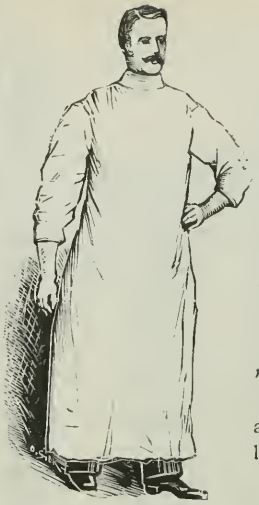


Fig. 1.

Fig. 1.
APRONS, as suggested and worn by Mr. Thelwall Thomas, of Liverpool.

Price 9/- each.

Measurements required—
Circumference at chest, and length desired.

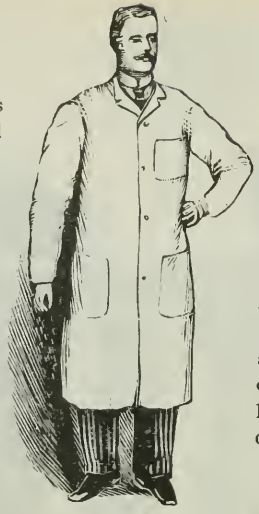


Fig. 2.

Fig. 2.
COAT, with three pockets.

Price—**18/-** ea

Measurements required—
Circumference at chest, length of sleeve, and length of coat desired.

Fig. 3.

Fig. 3.
OVERALLS, with Helmets, for infectious cases.

Price— **15/-** ea.

Measurements required—
Circumference round neck and chest, length of sleeve, and length of overall desired.

Muslinette Aprons and Coats for Surgeons and Accoucheurs, Overalls for Physicians in Attendance on Infectious Cases.

MUSLINETTE is a light waterproof material that can be washed and treated with antiseptics. It is unaffected by a temperature of 212° F., and therefore can easily be rendered aseptic.

They can also be supplied in WHITE DRILL: Aprons, 5/-; Coat, 7/6; Overall, 8/- each.

LACTOPHOSPHENE

A TONIC FOOD

consisting of the Glycero-phosphates of Sodium, Calcium and Magnesium, in combination with Pure Milk Proteid.

THIS PREPARATION, which contains phosphorus in an easy assimilable form, possesses highly stimulating properties, and is a most valuable adjunct to the diet of invalids and convalescents.

Owing to the presence of those elements necessary to the condition of muscular and nerve tonicity, it is particularly indicated in cases of **Neurasthenia** and of physical debility arising from **Malnutrition.**

Lactophosphene is also of the greatest value in the treatment of those affections producing hypersensitivity of the alimentary canal, such as **Gastritis, Gastric** or **Duodenal Ulcer,** and **Intestinal Catarrh.**

Being entirely purin-free, it produces no uric acid, and is therefore admirably adapted as a Food for **Gouty** and **Rheumatic** subjects; also owing to the fact that it contains no carbohydrates, it can be given with confidence to **Diabetics.**

Dosage.

Adults.—Two teaspoonfuls three times a day. Even more may be taken without causing digestive disturbance.
Children.—From one to two teaspoonfuls twice a day, according to age.
Infants.—A few grains added to each alternate bottle of milk.

Method of Administration.

Lactophosphene may be added to food to increase its nutritive properties, or it may be taken in water or other liquids.

When used with food, it may either be added in the cooking or afterwards, as desired.

Taken in fluids, the required quantity of **Lactophosphene** should first be mixed into a paste with a small quantity of the liquid, and then the remainder added gradually, stirring constantly.

Lactophosphene may be taken in any liquids, either hot or cold, but not with those of an acid nature, such as Lime Juice, Lemonade, etc.

Prices 1/- and 2 6 per tin.

MANUFACTURED BY

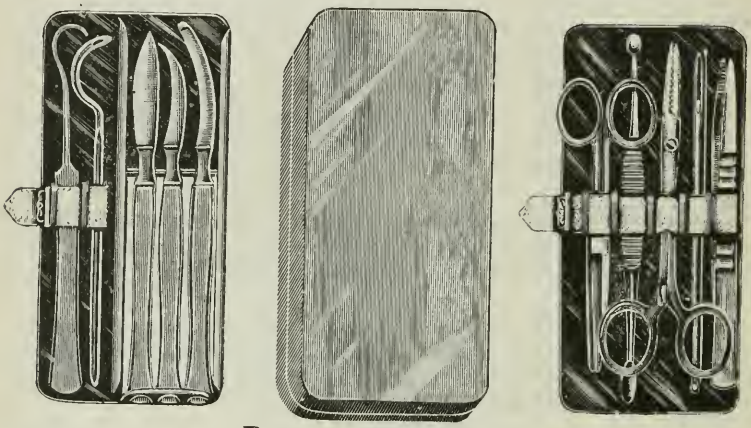
R. SUMNER & Co., Ltd., Liverpool.

SUMNER'S

NEW

Surgeon's Pocket Case.

The Instruments lie on metal trays, on the model of our well-known Minor Operating Case (see inside front cover of "Medical Annual.")



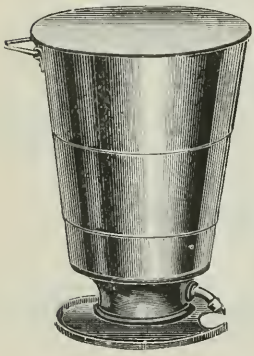
PRICE - **27/6**

In this Case there are two trays only, which carry Finger Knife, Symes' Knife, Blunt Bistoury, Hook, Double Scoop, Dressing and Artery Forceps, Spatula, Scissors, Probes, Director and Aneurism Needles.

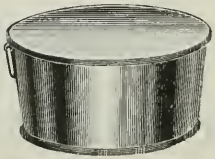
This arrangement of carrying instruments on metal trays is a distinct improvement to the usual method of clips, etc. The trays fit into a strong, seamless, double metal case which is carried in an outer leather case.

Aluminium Collapsible Douche

A USEFUL ADDITION TO A DOCTOR'S EQUIPMENT.
—CONVENIENT FOR PATIENTS TRAVELLING.—



When closed it goes into a small compass, when pulled out it holds about a quart of fluid. May be adapted for any kind of douching. Is extremely light.

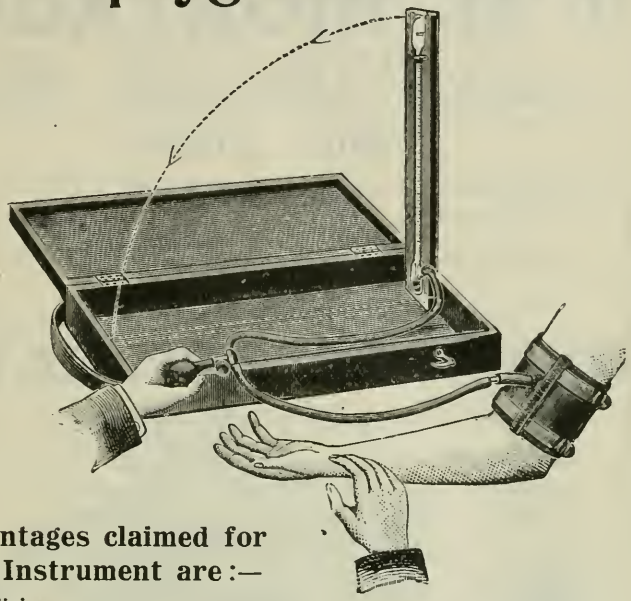


✲ ✲

PRICE, without tubing or fittings :—

5/- each

'Cook's' Sphygmomanometer



Price
42/-

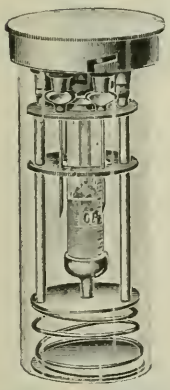
The Advantages claimed for this Instrument are:—

Simplicity.
The Systolic Pressure can be read accurately and immediately.
The Mercury cannot be spilt.
The Instrument is always fitted up ready for use.

The specially designed case is made large enough to allow the Physician to carry Stethoscope, Note Book, etc.

CAIRD'S

Hypodermic Syringe with Sterilizing Bottle.



The Syringe, a 20 minim size, is suspended together with six needles in a glass tank $3\frac{3}{4}$ by $1\frac{1}{4}$ inches. The tank has a bayonet-pointed metal cap, lined with a special washer which makes it quite water or spirit-tight. The Syringe and Needles can therefore be kept ready sterilized by suspending them either in Alcohol or a solution of Cresol, thus saving the operator the necessity of boiling the instrument each time it is used.

Price 12/6

R. SUMNER & CO. LTD.

Telegraphic Address—"MASTOID," LONDON. Telephone No. 2651 Gerrard.

J. H. MONTAGUE,

Surgical Instrument Maker and Cutler,

BY APPOINTMENT TO . .
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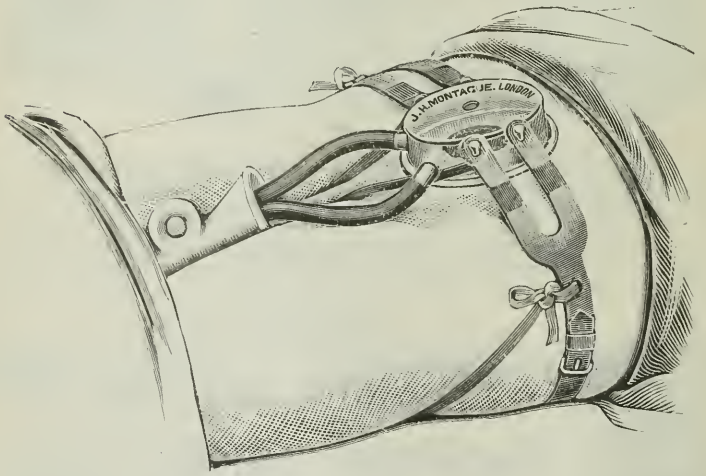
SUPRA-PUBIC
DRAINAGE APPARATUS.

Devised by Dr. HAMILTON IRVING.
Vide *The Lancet*, December 21st, 1907.



A Simple Method of keeping the Patient dry and comfortable after the Operation of Supra-pubic Cystotomy, and saving all other dressing.

FULL PARTICULARS SENT ON APPLICATION.

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Apparatus for X-Ray Work Ionic Medication, &c.

BRITISH MANUFACTURE. HIGHEST QUALITY.

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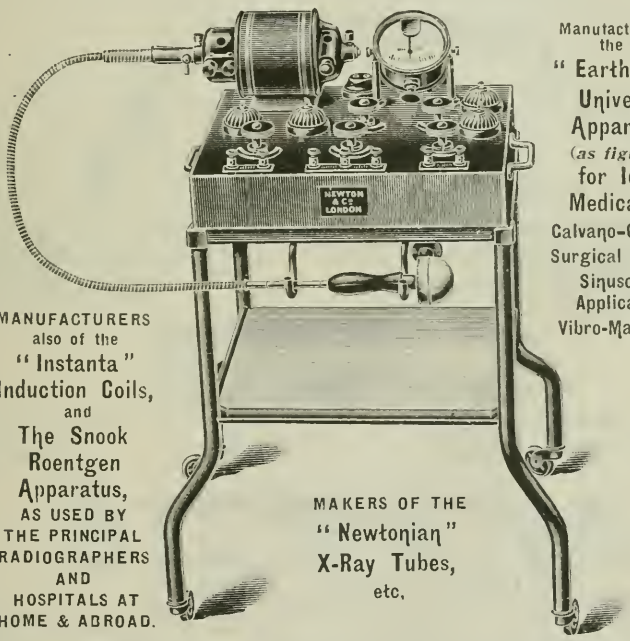
(Late Electro-Medical Dept. of NEWTON & CO., 3 FLEET STREET).

Electro-Medical Instrument Makers to the Admiralty, the War Office, the Indian Government, etc. Contractors to all the principal Hospitals.



Manufacturers of the New "Earth-Free" Universal Apparatus *(as figured)* for Ionic Medication, Galvano-Cautery, Surgical Lamps, Sinusoidal Application, Vibro-Massage, etc.

MANUFACTURERS also of the "Instanta" Induction Coils, and The Snook Roentgen Apparatus, AS USED BY THE PRINCIPAL RADIOGRAPHERS AND HOSPITALS AT HOME & ABROAD.

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Experimental and Assembling Workshops also at Wigmore Street.

☞ Write for Messrs Newton & Wright's Illustrated Catalogue of BRITISH-MADE Electro-Medical Apparatus.

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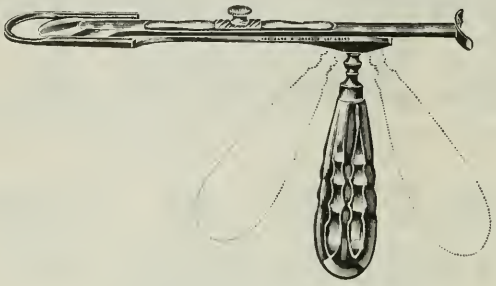
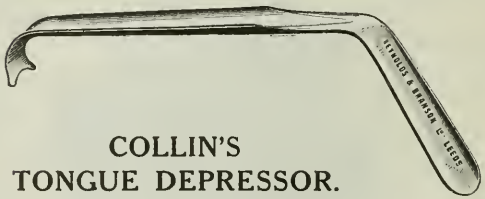


TONSIL GUILLOTINE.

(THREE ANGLES).

Mackenzie, Heath & Kelson's, **£1 5s.** each.
Mackenzie only, **£1 2s. 6d.** each.

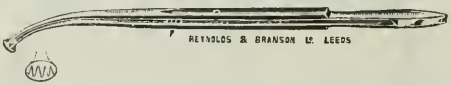


COLLIN'S TONGUE DEPRESSOR.

Double ended, one end being slightly hooked will be found most convenient for drawing the tongue forward in operations on the larynx; the other end is broad, flat, and slightly serrated. Price **4s. 6d.**

GODFREY'S TONSIL KNIFE.

A probe pointed knife, 9 in. long, all metal, with curved blade, 2 in. long; a safe and reliable instrument for enucleating the tonsils. Price **5s.**



TILLEY'S TONSIL FORCEPS.

Spring forceps, 8 in. long, slightly curved, with spring catch and "rat tooth" end; can be used in conjunction with the above instruments. A firm grip of the tonsil can be obtained, and the detached portion securely held.

Price **7s. 6d.**

REYNOLDS & BRANSON, Ltd.

Telegrams: "REYNOLDS, LEEDS." **LEEDS.** Telephone: No. 50.

ELECTRO-MEDICAL APPARATUS.

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X-RAY APPARATUS
INDUCTION COILS
INSTANTANEOUS APPARATUS
HIGH TENSION RECTIFIERS
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ACCUMULATORS
COMPRESSORS
PROTECTIVE TUBE STANDS
FLUORESCENT SCREENS
SCREENING STANDS
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PORTABLE X-RAY OUTFITS
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MERCURY INTERRUPTERS
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MERCURY VAPOUR LAMPS
CENTRIFUGES
CAUTERY BURNERS
CYSTOSCOPES, Etc.
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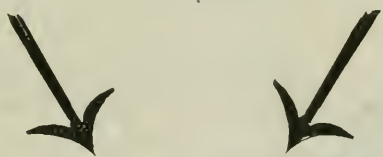
DIATHERMY
PORTABLE HEAT APPARATUS
PORTABLE MASSAGE do.
TYRNAUER APPARATUS, Etc.



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on a new principle, giving the highest sensitiveness with the greatest discrimination of detail.

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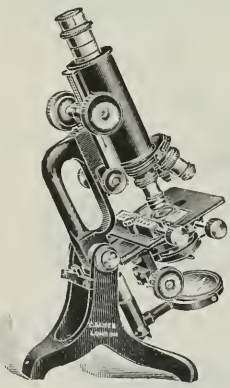
MICROSCOPES

specially designed for Bacteriological, Blood Examination, and other Medical Work.



NEW MODEL D.P.H. MICROSCOPE

(As figured), with mechanical stage *built on the stand*, Abbe condenser and iris diaphragm, triple nosepiece, 2 eyepieces. Objectives: $\frac{2}{3}$, $\frac{1}{6}$, $\frac{1}{12}$ oil immersion N.A. 1.30; this latter gives an *exceptionally flat field and perfect definition.* In mahogany case **£22 5 0**

NEW MODEL D.P.H. TRAVELLING MICROSCOPE

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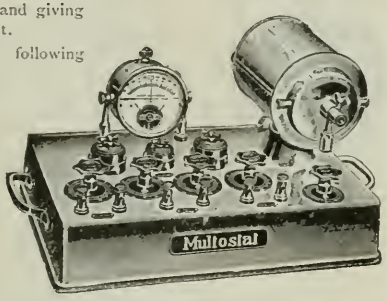

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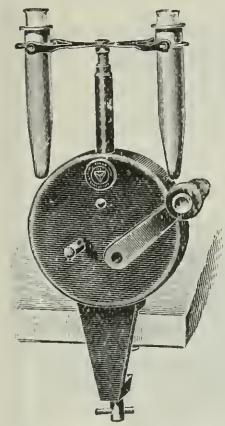

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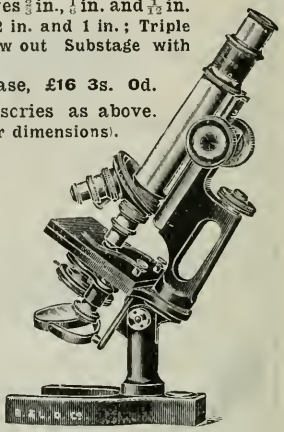

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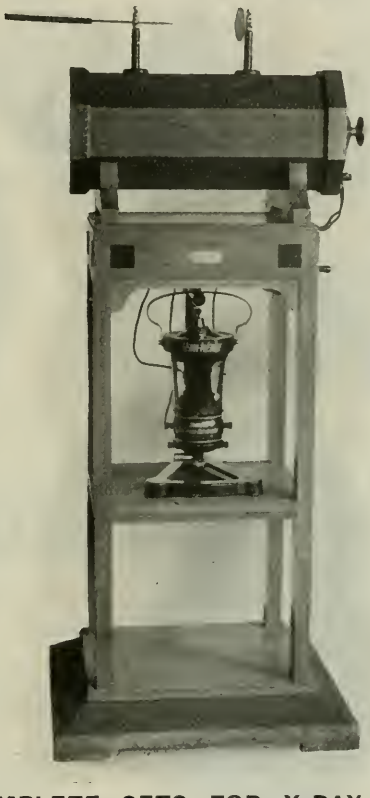

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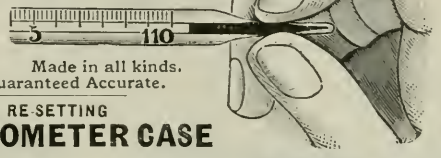

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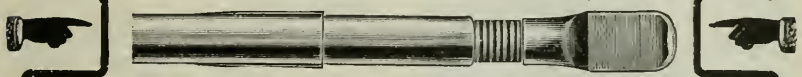

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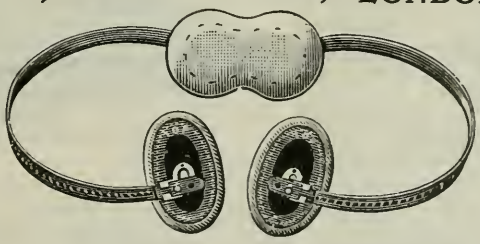

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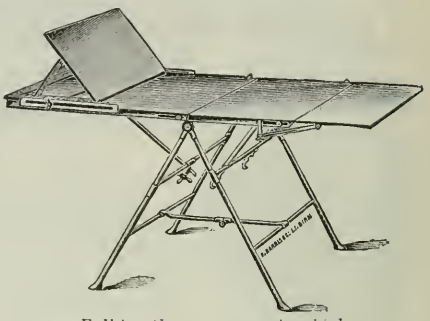

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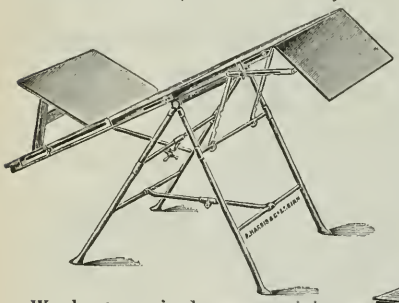

See *B.M.J.*, September 16th, 1911, page 347, also *The Practitioner*, August 1911, pages 271 and 272.

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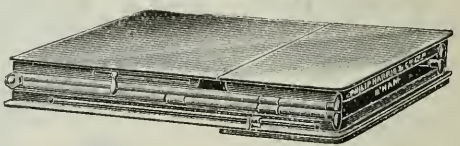

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J. HALL-EDWARDS, L.R.C.P., F.R.S.Ed., Hon. F.R.P.S.
Senior Officer in Charge of the X-Ray Department at the General Hospital, Birmingham.

See "**The Use of Carbon Di-oxide in Dermatology,**" by EDWARD R. MORTON, M.D., F.R.C.S., in the *B.M.J., September 24th, 1910*; *LANCET, August 20th, 1900.* "**The Therapeutic effects of Carbon Di-oxide Snow, methods of collecting and application.**"—By J. HALL-EDWARDS, *LANCET, July 8th, 1911*, pages 87 to 90.

THIS Apparatus has been designed to obviate the crude and wasteful method of collecting Co_2 Snow. The Collector not only admits of the obtaining of the small and necessary amount of snow for one treatment without waste, but it renders it unnecessary to transfer the snow from one piece of apparatus to another, a compressed tablet being produced with the greatest ease in two or three minutes. (*Fig.* A) illustrates method of collecting.

FIG. A.

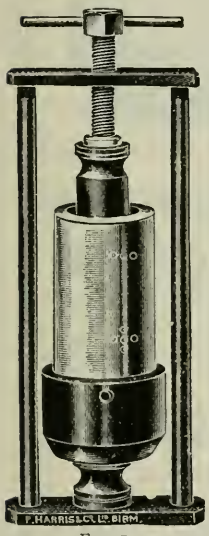

FIG. D.

Most Surgeons prefer to use the Snow much more firmly compressed than it is possible to make by hand-pressure alone. To facilitate the obtaining of this, Mr. HALL-EDWARDS devised a special screw-clamp (See *Fig.* D which illustrates the Collector and Plunger in position); pressure can be brought upon the tablet by the hand-screw. By this means a tablet can be prepared which is of great hardness, is nearly transparent, and sinks in water.

The Plug fitting into the bottom of the Collector is hollowed out into the shape of a cone, so that the tablet, when prepared, consists of a cylinder of compressed Snow with a cone-shaped projection (see *Fig.* E). By cutting off with a knife the point of this cone, it will be seen that a surface of any desired diameter can be obtained.

If after preparing a hardly-compressed tablet, the apparatus be left clamped up, the Snow will keep for a considerable time, and the whole apparatus can be carried in a hand-bag for some distance without it being necessary to move about a cumbersome and heavy gas-cylinder.

FIG. E.

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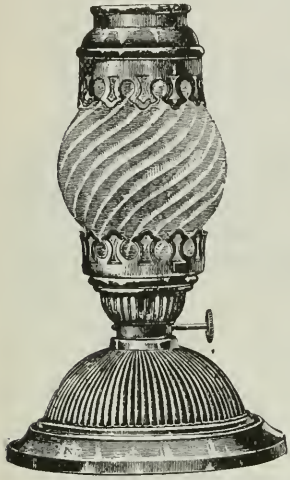

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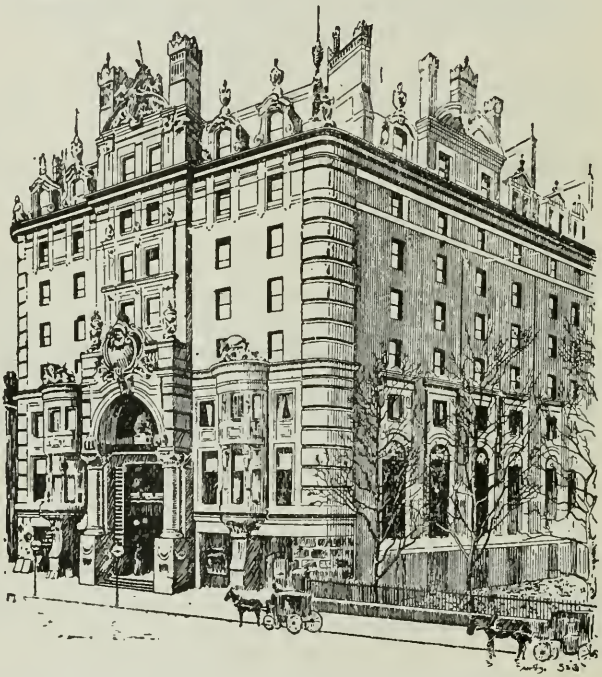

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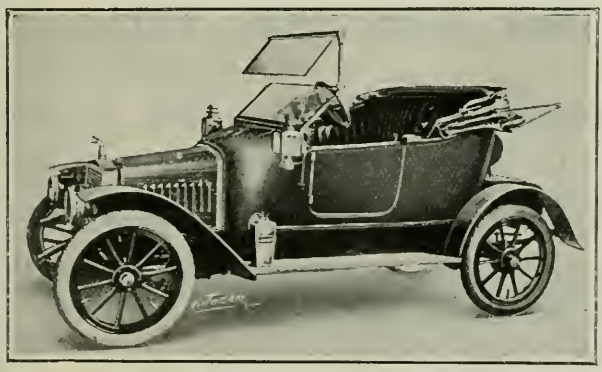

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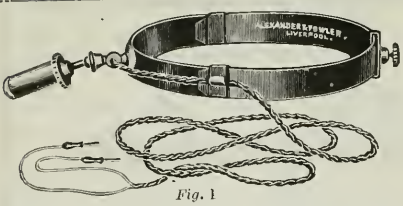

Fig. 1

FIG. 1—

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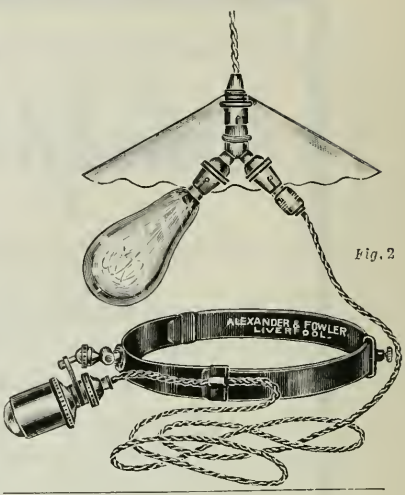

Fig. 2

FIG. 2—Similar Apparatus for use on Electric Main Supply. Complete with Cords. Resistance Lamp. and Adapter to plug into ordinary lamp holder, **25/-**

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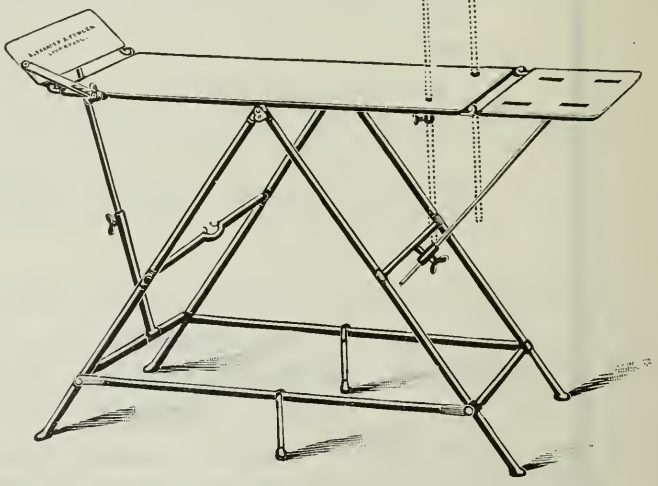

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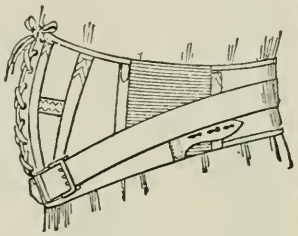

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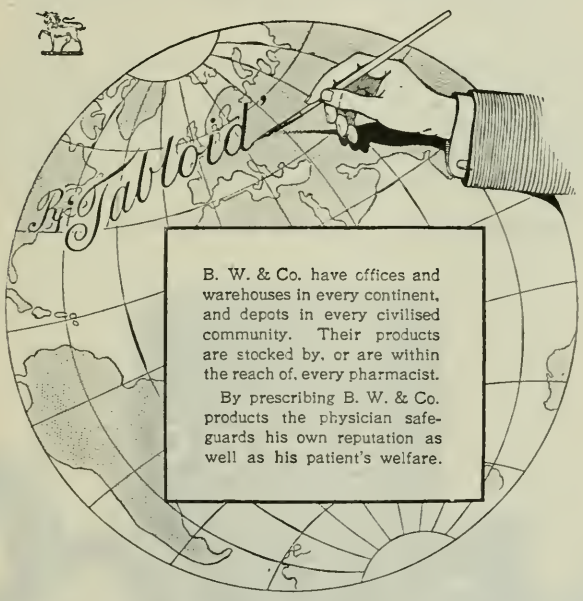
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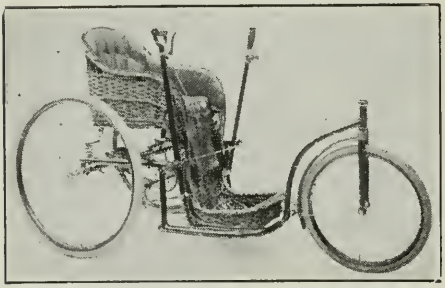

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In preparing the thirtieth edition of the *Medical Annual* the large amount of scientific practical work which has been done during the past year is again most noteworthy. Much of this represents improvements in technical detail—diagnostic, therapeutic, and surgical. The chief value of this information to the practitioner depends upon his ability to refer to it without delay when a case arises requiring its practical application. We may remember to have read of some new method, but when we want to employ it, time cannot be spared to find the source of our information. The *Annual* supplies at once the whole literature upon the subject, filtered of extraneous matter, crystallized, submitted to criticism, and so arranged that it is immediately available for reference.

To perfect this system has been our constant study during the past thirty years. If we claim to have raised the standard of efficiency of the general practitioner wherever the *Annual* circulates, we take no merit to ourselves, but simply recognize in it the result of that high sense of duty which impels the practitioner to do the best possible for his patient. If this were not so, our labours would be in vain. The circulation of the *Annual* steadily grows, not merely because we continue to perform our appointed task, but because the already high standard of efficiency set themselves by the profession steadily advances.

We are glad to find that the inclusion in the Dictionary of new Treatment of references to the remedies reported in the Therapeutic Section has met with general approval. It will therefore be continued.

We have done our best to make the *Annual* answer the questions that may be put to it. If we have failed in any particular this year, our readers have only to point it out to be assured that our next volume will bring the subject up to date.

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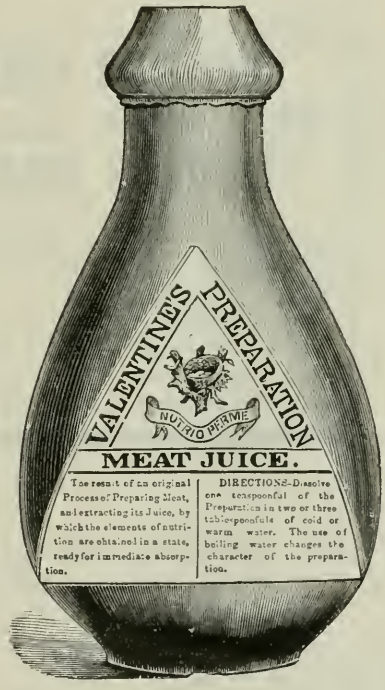
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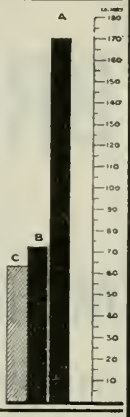

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THE MEDICAL ANNUAL

Part I.—The Dictionary of Materia Medica and Therapeutics

REVIEW OF THERAPEUTIC PROGRESS, 1911.

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GENERAL REVIEW.

THIS has most decidedly been the year of salvarsan. There has been little interest taken in any other therapeutic agent. The clinical literature on salvarsan has been most extraordinarily extensive. The general impression of those who have used the drug on a large scale, is that it is much the most potent antisyphilitic remedy we possess. Unfortunately, its range of successful action seems practically parallel with that of the other antisyphilitic remedies, though salvarsan surpasses them all in rapidity of action. During the past year a large number of syphilitic cases have been reported which it is alleged have proved refractory to mercurial treatment. On instituting treatment with salvarsan, in the majority of the cases a rapid clinical improvement was obtained. It is difficult to understand how so many mercury-refractive cases were observed. Possibly everyone was so eager to use salvarsan that the period of mercurial treatment was cut down, and it was hastily assumed that it had proved of no use. Salvarsan seemed also of more use in malignant cases of syphilis than mercury. On the other hand, salvarsan is not superior in the parasyphilitic forms of syphilis. Ehrlich's expectation that syphilis would be eradicated by a single injection has not been substantiated, and except in a very small number of cases further clinical evidence of the disease appears if the patient is kept under observation Apart from syphilitic conditions, the drug seems to be of use only in a few spirochætal diseases, e.g., yaws and Vincent's angina. The reports about salvarsan have mainly dealt with its clinical application, and but little is known about the pharmacology of the drug.

DICTIONARY OF REMEDIES.

ADALIN.

A new hypnotic and sedative has been put upon the market by Bayer & Co., under the trade name of adalin. Chemically considered, the new drug is a urea derivative, the urea being combined with an acetyl group, in which the three hydrogen atoms are replaced by one atom of bromine and two ethyl groups. The chemical formula is therefore diethylbrom-acetylurea

$$\begin{matrix} C_2H_5 \\ C_2H \end{matrix} > C < \begin{matrix} Br \\ Co—NH—CO—NH_2. \end{matrix}$$

Adalin is soluble in chloroform (1–6), methyl alcohol (1–14), ether (1–24), absolute alcohol (1–40), and in water only in about 1–2500. Experiments on animals show that the drug acts as a hypnotic. In the cat 0·15 gram per kilo body weight produces a light sleep lasting some hours. In the dog 0·1 gram per kilo produces the same effect, and following the sleep there is a prolonged period of drowsiness. During the sleep the blood-pressure is very slightly reduced, the heart is slightly slowed, and the vessels are dilated a little. The drug is excreted by the urine (1) partly unchanged, (2) partly as an organic substance, (3) partly as inorganic salt of bromine. The minimum lethal dose for cats is about 0·3 gram per kilo body weight, but many cats can survive much higher amounts than this.

Adalin has been tried clinically in many different conditions requiring a sedative or hypnotic, and those who have used the new drug seem to be satisfied with its action. It is claimed that when given in sufficient quantity, adalin produces sleep within about an hour, which lasts for about five or six hours without causing any unusual depression of the circulation or respiration. The patient wakes up without any headache or mental confusion, though in some cases drowsiness is prolonged well into the next day. It is said to produce no gastric irritation, and its use is not followed by symptoms of bromism. The insoluble drug has no taste or odour, and is readily taken by patients. So far no cases of poisoning have been reported, though in some cases of epilepsy and mania large doses have been employed.

Among those who recommend it is Schaefer,[1] who finds the drug reliable in doses of ·5 gram in cases of **Insomnia** due to slight pain, organic disease of the central nervous system, etc. As a sedative for conditions of **Mental Excitement** he advises a larger dose of from ·75 to 1 gram. In one instance he found the drug useful in an unusually severe girdle sensation in **Tabes.** Froehlich[2] used adalin in several cases, and found it a reliable hypnotic in doses of 1 gram. It is best administered suspended in hot water ; or the dry powder may be put on the tongue and washed down with warm water or tea. As a sedative for restless, excited mental cases he gives from ·3 to ·5 gram thrice daily. Its chief merits are that it has no cumulative action, and does not irritate the stomach or produce bromism.

Hirschfeld[3] recommends the drug in **Neurasthenic Conditions** of anxiety, restlessness, and irritability. He has used it very often in **Cardiac Neuroses,** and in all these cases found it superior to the ordinary bromides. It does not control more serious nervous troubles such as chorea. For a prompt sedative action he recommends ·5 gram thrice daily. As a hypnotic the dose is 1 gram and upwards, which should be given as a single dose, or in two divided doses, shortly before going to bed. Traugott[4] prefers the former plan, as he has noted that after the first dose an unpleasant sensation of weariness is produced. Scheidemantel[5] used the drug with success in the **Sleeplessness** following acute infectious fevers, hyperthyroidism, and hysteria. It acts in the presence of slight **Neuralgic Pain,** but is useless for severer pain due to pleurisy or peritonitis. As it is not a depressant to the circulation, it can be used in **Aortic Distress** and even in **Angina.** In a small series of **Epilepsy** cases the drug seemed to diminish the frequency of the fits. Beyerhaus[6] has tested the remedy in **Asylum Practice.** As a sedative in excited maniacal cases he gives ·5 gram from two to five times in the day. The drug has the tendency in sub-hypnotic doses to induce a restful, sleepy condition, which he finds very useful in the treatment of patients suffering from motor restlessness. After repeated small doses it is usually possible to keep such patients quiet in bed. Even after very large doses of 1·3 to 2·5 grams in the day, the drug causes no unpleasant side-actions. It is not cumulative, and does not seem to lose its action, so that the dose need not be raised. Salamonski[6] found the drug useful in cases of **Sexual Neurasthenia,** and states that it acted well when sleeplessness was due to erotic thoughts and erections. He also found it of use in overcoming masturbation.

REFERENCES.—[1]*Münch. med. Woch.* 1910, Dec. 20; [2]*Berl. klin. Woch.* 1911, Jan. 21; [3]*Ibid.* 1911, Feb. 20; [4]*Ibid.* 1911, Feb. 13; [5]*Münch. med. Woch.* 1911, Feb. 21; [6]*Deut. med. Woch.* 1911, Ap. 6.

ADRENALIN.

The danger of **Air Embolism** is that the right ventricle becomes full of air, so that the valves will not act, and the blood cannot be pumped to the lungs. On the other hand, if the air can be removed from the right ventricle, it is rapidly disposed of, and the danger disappears. By a series of experiments on animals, in which air was intentionally introduced into the jugular veins, Blair and M'Guigan[1] found that one of the best methods of removing the air from the heart consisted in stimulating it to violent contraction by means of adrenalin, either directly applied or forced in through the jugular vein. They find that small quantities of air are not of serious moment, and probably death from air embolism is clinically a rare thing; but, should grave depression follow the aspiration of air into a vein, they propose that a fairly concentrated solution of adrenalin be introduced directly into the right ventricle. The accident of air embolism is most likely to occur when the large veins in the neck are exposed. In such cases the suggested treatment consists in introducing into the vein a douche

point, or transfusion needle, attached to some sort of transfusion apparatus. Two c.c. of adrenalin solution 1–1000 should then be injected by a hypodermic needle into the rubber tube close to the needle. On allowing the saline solution to run into the vein, the adrenalin in fairly concentrated solution is forced into the heart, and thereby violent contractions are induced, which dislodge the air, and enable the circulation of blood to be started again. The saline solution can be run in with probable safety at a pressure of 25 to 30 cmm. of water pressure.

Reference.—[1]*Ann. Surg.* 1910, Oct.

ALBARGIN.

As the result of ten years' clinical experience with this drug, Seegall[1] recommends it as the best silver preparation for **Gonorrhœa.** For ordinary injections he uses it in the strength of from 1 to 3 per cent. He finds it has a reliable action in killing the gonococci, and does not irritate the mucous membranes much or produce unpleasant sensations. It can be used at all stages of the disease. Finally, it is cheap, and easily prepared, as albargin dissolves readily in water.

Reference.—[1]*Berl. klin. Woch.* 1911, Mar. 13.

ALCOHOL.

Schumburg,[1] in reply to an article by Sick[2] recommending the use of spirit of soap for the **Surgical Disinfection of the Operator's Hands,** claims that better results are obtained with alcohol alone. According to Schumburg, by using alcohol alone, without any previous washing with soap, it is possible to sterilize the hands to such an extent that from 99·9 to 100 per cent of the germs are killed. With spirit of soap alone the sterilization is much more uncertain, and in many instances is practically useless. Thus he records a series of experiments in which the percentage of germs killed off were respectively 99·91, 98·8, 81·3, 87·7, 95·9, 99·3, 90, 90·5, 11, 5·9, 27·9, 34·9, 91·4, 99·98, 99·4, 99·89 per cent. Thus, though the results in many cases were satisfactory, in other instances they were practically useless. Further, he does not agree with Sick that the sterilizing action of alcohol only lasts for a few minutes, as he finds that even after twenty minutes' exposure of the hands in a hot-air chamber to induce sweating, the percentage of surviving germs was never greater than 0·1 or 0·2 per cent ; and similar results were obtained if the hands were washed with sterile soap and water to loosen the cells and enable the deeper-seated germs to reach the surface. In using alcohol it is not advisable to employ a preliminary cleansing with soap and water, but rather to remove gross dirt by rubbing the hands with gauze soaked in alcohol. The one objection to the use of alcohol is that it does not readily remove blood and pus from the hands during an operation. If the hands become thus contaminated, it is best to cleanse them with a solution of 10 per cent hydrogen peroxide, dry them thoroughly, and then sterilize with alcohol. The advantages of alcohol consist in the fact that it is reliable as a disinfectant, does not irritate the hands,

though it exerts an action on the deeper structures, while it is simple to use and cheap.

Vogt[3] found that alcohol had a deleterious action upon the memory. After taking about one ounce of alcohol after breakfast, he found that he required a longer time to learn off by heart a stated portion of Greek verse. If the alcohol was taken on an empty stomach this action was much more marked, and was seen with a smaller dose. On revising his work some months later, he found that the lines learnt under the influence of alcohol were more imperfectly remembered than those learnt on the days when no alcohol was used.

Alcohol Vapour.—Willcox and Collingwood[4] find that oxygen gas containing alcohol vapour acts as a powerful cardiac stimulant in cases of heart failure. The administration is pleasant and non-irritating to the patient. No ill-effects are produced. The best method is to allow the oxygen gas to bubble rapidly through a layer of absolute alcohol contained in a wash-bottle. The mixed gas is then administered by a funnel, as in the ordinary administration of oxygen. It is best to use absolute alcohol, as less concentrated spirit does not permit the oxygen to take up so much alcohol. In health the administration of the alcohol-oxygen vapour does not produce much action; but in cases of failing heart, e.g., in **Pneumonia**, or during anæsthesia, the rapid feeble pulse becomes stronger, and is slowed by some ten to thirty beats per minute, and a low blood-pressure is raised by 10 to 30 mm. Hg. The full effects of the administration are obtained after five minutes, and last for several minutes. As they pass off the administration may be repeated. The method has proved valuable in cases treated at St. Mary's Hospital.

References.—[1]*Deut. med. Woch*, 1911, May 18; [2]*Ibid.* 1911, No. 17; [3]*Norsk. Mag. f. Laegevid*, 1910, 605; [4]*Brit. Med. Jour.* 1910, ii. 1411.

ARSENIC.

Gunn and Feltham[1] have investigated the effect of weak solutions of arsenic in inhibiting the hæmolytic action of hypotonic saline solutions. They used various hæmolytic agents, such as pure water, cyclamin—an active hæmolytic agent of the saponin group—and sodium glycocholate, and found that with all these agents arsenic, whether in the form of arsenite or arsenate, exerts on the red blood corpuscles an action antagonistic to the hæmolytic effect. They found that in some experiments the arsenic was taken up by, or at least retained its protecting action on, the corpuscles, even after these had been washed several times in saline. They conclude that the protective action on the formed red corpuscles against normal or abnormal hæmolytic processes may, in part at least, account for the as yet imperfectly explained benefit which results from the medicinal administration of arsenic in blood diseases. Croce[2] has investigated the action of small doses of arsenic on the metabolism of growing rats. He finds that arsenic increases the weight of animals upon a constant diet, though the controls were consuming as much food as the arsenic animals. There

was no retention of nitrogen by the arsenic animals, so the increase in weight under minute doses of arsenic seems to depend upon some diminution in the oxidation processes, which leads to a lessened metabolism.

REFERENCES.—[1]*Brit. Med. Jour.* 1911, Jan. 21 ; [2]*Zeits. f. klin. Med.* 1911, Vol. xxxii. Pts. i and ii.

ASCITIC FLUID.

Carter,[1] when investigating the problem how to administer protein hypodermically, discovered this is possible by using ascitic fluid obtained from patients suffering from hepatic cirrhosis or cardiac dropsy. The patient selected must be absolutely free from all trace of toxæmia. As the protein content varies in different samples of ascitic fluid, it is well to estimate the content in nitrogen. To obviate any danger of transmitting disease, the Wassermann test should be applied, and tubercle eliminated by injecting the fluid into guinea-pigs. For short periods dogs can be maintained nearly in nitrogenous equilibrium by hypodermic injections of the ascitic fluid. Thus the N – loss was less when ascitic fluid, representing ·4 gram nitrogen per kilo body weight was injected, than when ·6 gram nitrogen per kilo body weight was given by the mouth ; but ·4 gram nitrogen per kilo body weight means a large quantity of fluid, as the nitrogenous content of ascitic fluid is low. Hence it is inadvisable to attempt to administer the whole protein content hypodermically, as temporary œdema and renal mischief may be caused. Theoretically the subcutaneous administration of protein is indicated in various clinical conditions, when there is inability to absorb protein by the normal channels, in severe **Diarrhœa** or **Vomiting** when the tissues are dried up from loss of fluid, in **Marasmus,** and in certain blood conditions, **Hæmophilia,** etc. Clinically, Carter has used ascitic fluid hypodermically in nine cases of very severe **Gastro-intestinal Catarrh.** In three cases the therapeutic results were good ; two were cured after a single injection, and the other improved and put on weight during the week in which it lived. The initial dose is 15 to 30 c.c., and if there is no amelioration this dose can be repeated in twelve hours. In one case Carter gave for eight days from 20 to 30 c.c. daily of an ascitic fluid containing 0·34 per cent of nitrogen

REFERENCE.—[1]*Amer. Jour. Med. Sci.* Aug. 1911.

ASPIRIN.

Aspirin is one of the salicyl compounds which is in constant use, both by orders of medical men and by the advice of lay friends ; it is well therefore to remember that occasionally a rather alarming train of symptoms may result from the use of even such a small quantity as 5 gr. The symptoms are perfectly typical. Within an hour or two of swallowing the drug an œdematous swelling of the face, lips, and tongue develops. The face is red and swollen, the conjunctivæ are injected. The swelling of the lips and tongue is so great that the lips are everted. The mucous membrane inside the mouth is frequently

involved in the œdema, and the tongue and fauces are both swollen. Fortunately, the œdema, which is probably due to some vasomotor disturbance, does not last more than a few hours as a rule, and the acute symptoms rapidly subside, though the swelling may take a few days to disappear. In the past year typical cases of aspirin idiosyncrasy have been reported by Graham,[1] Morgan,[2] and Buhlig,[3] in each instance after the use of a 5-gr. tablet of the drug.

REFERENCES.—[1]*Jour. Amer. Med. Assoc.* 1911, Jan. 28; [2]*Brit. Med. Jour.* 1911, Feb. 11; [3]*Bull. North-West Univ. Med. Sch.* 1910, Dec.

ASUROL.

Asurol is a soluble mercury compound in which a double salt of mercury and salicylic acid is combined with an amino-fatty acid. Chemically it is the amino-oxy-isobutyric acid compound of mercury salicylate. It is soluble in water, and does not coagulate albumin. It contains about 43·3 per cent of mercury. Neisser reported that the preparation was of distinct value as a means of treating **Syphilis** by injections. A recent report by Mayer,[1] based on thirty-four cases, bears out these claims. He used originally a 5 per cent solution, but latterly increased the strength to 10 per cent. To this is added 1½ per cent of alypin nitrate as an anæsthetic. The injections cause almost no discomfort. Excellent results were obtained with a series of twelve injections of 2 c.c. of the asurol solution twice weekly, i.e., ·967 gram of mercury during the whole course. The therapeutic results were rapidly obtained, and primary and secondary symptoms cleared up quickly. Occasionally slight intestinal colic is seen after an injection, and on one occasion stomatitis developed. As the preparation belongs to the class of soluble mercurial salts, the mercury is not long retained in the tissues, and it is advisable to alternate the asurol treatment with inunction courses. Mayer recommends asurol wherever a rapid mercurial action is desired, as it causes no discomfort and produces an energetic therapeutic effect.

REFERENCE.—[1]*Berl. klin. Woch.* 1911, Mar. 20.

ATOPHAN.

This remedy, a compound of phenylchinolin and carbonic acid ($C_{16}H_{11}NO_2$), has, according to Nicolaier and Dohrn,[1] the effect of increasing the excretion of uric acid in health. Heller[2] has used the preparation with excellent results in seven cases of **Gout,** all of which cleared up under small doses within a few days. He then tested its action in forty cases of acute and chronic **Rheumatism.** He found that in the acute manifestations it acted well, relieving pain rapidly and removing fever; but in the chronic cases it had no action. In the acute cases he noted that very little perspiration was produced. It seemed to have some slight laxative action, as most of the patients stated that their bowels moved more easily than usual. The urine of gouty patients under atophan deposited a copious sediment of uric acid, but this was not seen in the acute rheumatic cases. The drug is given in from 3 to 5 grams daily. Weintraud[3] found that in

gouty patients on a purin-free diet, atophan more than doubled the quantity of uric acid excreted in the urine, but subsequently the excretion fell below normal. The drug seems therefore undoubtedly to increase the renal excretion of uric acid. In healthy individuals under its influence the urine secreted is turbid from the presence of urates. In gouty individuals, unless special precautions are taken, the excess of uric acid in the urine may cause precipitation of uric acid in the urinary tract, and induce an attack of gravel. Consequently, he advises that gouty patients while taking atophan should drink large quantities of fluid and use alkalies in large doses, e.g., 15 grams of sodium bicarbonate on the first atophan day, and from 5 to 10 grams on the succeeding days of treatment. It is difficult to explain how the excessive secretion of uric acid is induced by atophan. Though there is no increased exertion of phosphoric acid, Nicolaier and Dohrn assume that the increase of uric acid arises from the breaking up of nuclein, but Weintraud[3] cannot accept this explanation. As the increase in the uric acid excretion is greatest in the first days of atophan treatment, and falls with continued administration of the drug even if the dose is increased, and as the stopping of the drug induces a diminished secretion below the normal quantity, he thinks it more probable that the uric acid is formed from some substances which are present even in health, possibly that part of the endogenous aminopurin and oxypurin which is not eliminated as uric acid in ordinary circumstances. When, under the influence of atophan, uric acid is removed from the body, this proportion, which is normally metabolized into some other substances, is converted into uric acid. This alone, he thinks, can explain how it is possible in health to increase the excretion of uric acid on a purin-free diet without increasing the total nitrogenous and protein metabolism. In gouty individuals with a larger accumulation of uric acid deposited in the tissues, this surplus uric acid is available, and is drawn upon to make good the loss of uric acid under atophan.

Tschernikow and Magat[4] have also noted an increased excretion of uric acid in healthy and diseased conditions (cancer of the liver, cholelithiasis). There was no corresponding increase of nitrogen excretion or leucocytosis. In **Gout,** under atophan there was an immediate improvement in both the subjective and objective symptoms. Similar good results were obtained in acute **Muscular Rheumatism;** but the drug had no beneficial action in chronic rheumatism. Frank and Bauch,[5] working in Weintraud's clinique, have investigated the action of atophan with the object of determining whether it renders uric acid more easily excreted. With this object they investigated the excretion in healthy and in gouty individuals of uric acid injected intravenously. The uric acid was dissolved in an aqueous solution of piperazin. In health, on a purin-free diet, the intravenous injection of 0·5 gram of uric acid is followed by a somewhat slow elimination extending over two to four days. If atophan is administered the excretion of the injected uric acid is much more prompt, and in three out of four cases it was entirely eliminated within twenty-four hours,

though three of the cases were gouty individuals. They conclude that atophan renders the uric acid more easily excreted by the kidneys, and on this account hold that Garrod's view is correct, that the primary cause of the retention of uric acid in gout is due to some difficulty on the part of the kidney in eliminating uric acid. Just as phloridzin renders the kidneys more permeable for sugar, so atophan enables the kidney epithelium to secrete uric acid more easily. Under atophan the gouty individual gets rid of injected uric acid much more rapidly than the normal healthy individual, without atophan, excretes uric acid injected into the blood-stream.

REFERENCES.—[1]*Deut. Arch. f. klin. Med.* in *Therap.* 1911, Ap; [2]*Berl. klin. Woch.* 1911, Mar. 20; [3]*Ther. d. Gegen.* 1911, Feb. 15, in *Therap.* 1911, 61; [4]*Charkower. Med. Jour.* in *Therap.* 1911, 77; [5]*Berl. klin. Woch.* 1911, 1463.

BICARBONATE OF SODIUM.

In treating threatening **Diabetic Coma** with large doses of sodium bicarbonate it is sometimes noticed that the body weight becomes increased owing to the retention of fluid in the tissues. In investigating the mechanism of this phenomenon, Widal, Lemierre, and Cotoni find that this increase in weight depends only indirectly upon the alkaline salt, and is directly produced by a retention of the chlorides. Though to a certain extent increase in weight can be observed in healthy people taking large doses of sodium bicarbonate, it is much more evident in emaciated diabetics, when the retention of fluid may show itself in frank œdema and ascites. In one case a diabetic patient, extremely emaciated, was treated with bicarbonate for threatened coma. For this he received for six days 40 grams daily. During the first three days of the alkaline treatment his weight increased by 6 kilos, and then fell in the last three days by 3 kilos. The bicarbonate was then increased to 80 grams in the day, and within forty-eight hours his weight rose 6 kilos. Each increase in weight was preceded by a diminution in the excretion of urinary chlorides, and each fall in weight was preceded by an increased excretion of urinary chlorides. During the alkaline treatment he showed anasarca. On stopping the alkali the œdema passed off, and the weight fell within five days to 2 kilos below his weight before beginning the alkaline treatment. In a second experiment on the same patient the same result was obtained. During the whole experiment he was put upon a fixed diet containing 4 to 5 grams of chlorides. On this diet his weight fell from 43 to 42 kilos. In the next six days he was given, in addition to the diet, 80 grams of bicarbonate daily, with the result that his excretion of chlorides fell, and his weight increased to 45 kilos. During the next four days, the bicarbonate remained at 80 grams, but in addition he was given 12 grams NaCl, with the result that despite some increase in the excretion of chloride the weight rose to 48 kilos, and œdema appeared. During the next four days he received 100 grams bicarbonate and 16 grams NaCl daily. The chloride excretion did not increase, but the weight rose to 52 kilos. During the next four days the same quantity of NaCl was given, but the bicarbonate was stopped. This resulted in

a prompt fall of weight to 44 kilos, and the disappearance of the œdema. In a second case of diabetes, with a daily dose of 30 grams of bicarbonate there was distinct retention of chlorides, and dropsy appeared. In two other diabetic patients, who were not so markedly emaciated as the first two cases, the administration of bicarbonate produced a definite increase in weight, but the excretion of chlorides was sufficient to prevent the onset of dropsy. The same thing is seen in healthy individuals. Thus a healthy man was put upon a diet containing 12 grams of NaCl. During the next twelve days he was given 40 grams daily of sodium bicarbonate, and the weight increased by 2·3 kilos, while of the 150 grams of NaCl ingested only 118 appeared in the urine. It is not possible to induce dropsy in healthy individuals by administration of sodium bicarbonate ; and to produce an increase in weight it seems necessary to give over 20 grams daily. These observations indicate that just as the œdema in cardiac and renal disease depends upon a retention of chlorides in the tissues, so the œdema produced in diabetes by administering large doses of sodium bicarbonate also arises from the same cause.

Reference.—[1]*Sem. Méd.* 1911, 329.

BLOOD-LETTING.

Wallace Milne[1] puts in a plea for venesection. The operation is in itself free from danger. He narrates some cases of **Epilepsy** which were apparently greatly benefited by the blood-letting. In one case of status epilepticus, with great engorgement of the right heart and irregularity of the pulse both in time and quality, blood-letting to the extent of 20 oz. brought the patient to consciousness before the wound was closed, and there was no recurrence of the fits for three and a half months, though previously she had been having, on an average, one fit every week. In another case, where a patient had been afflicted with epilepsy for ten years, with a fit about every three weeks, a venesection to fainting point gave him freedom from his attacks for three months, though bromides were stopped. He was then bled on two occasions at an interval of a week, and had no fit for twenty months. In cases of impending **Apoplexy** venesection has also given him good results.

Reference.—[1]*Pract.* 1910, 842.

CACODYLATE OF SODIUM.

The interest in arsenical compounds aroused by the glowing accounts of the therapeutic efficacy of salvarsan has attracted renewed attention to the therapeutic value of the older preparations. Neumayer[1] tested the effect of intramuscular injections of sodium cacodylate and of atoxyl on rabbits infected with *Staphylococcus aureus*. Whereas the controls died in one to four days, those animals treated with the arsenic compounds survived much longer, but at the post-mortem examination virulent staphylococci could be isolated from the kidneys. Under cacodylate the lives of rabbits were prolonged one to four weeks, and under atoxyl twelve to sixteen days, provided a comparatively small

dose of the staphylococci was used, but with larger doses of staphylococci no inhibitory influence was apparent. Dawes[2] seems to have used cacodylate of sodium extensively, and possesses a high idea of its therapeutic value in **Pernicious** and **Simple Anæmias.** He claims that when cacodylate of sodium is injected intramuscularly the drug is decomposed into an active inorganic form, and is eliminated in the form of arsenates by the urine and fæces, and can be recovered in the form of inorganic arsenic in various tissues of the system, e.g., liver, muscle, and bone-marrow. In using cacodylates therapeutically, he advocates prescribing relatively large doses daily. Out of 14 cases of pernicious anæmia treated with cacodylate of sodium, either by himself or by other physicians, in four the drug had no great effect, while five are free from relapses after 3, 5, 6, 8, and 9 months respectively, and the other five cases appear to be true cures, as they have had no recurrences after 15, 18, 22, 25, and 37 months respectively. In 410 cases of simple anæmia treated by himself and others, there has been complete recovery in every uncomplicated case. Brilliant results were obtained in **Neuroses** accompanying anæmia. In **Neuritis** he obtained 16 recoveries out of 22 cases; and in **Eczema,** mostly of the squamous type, he had 15 cures out of 17 cases treated. It does not seem of much value in syphilis. The drug should be freshly prepared, as it deteriorates rapidly. He employs as an initial dose 1 mgram for each pound of body weight, gradually increasing to 2 or even 3 mgrams. It is injected into the muscle of the buttock. He ascribes the want of success of other men to the use of insufficient doses.

Nichols[3] finds that cacodylate of sodium has no action upon the number of the spirochætes present in syphilitic lesions in rabbits. The drug did not possess any spirillicidal action, whereas after treatment with salvarsan the spirochætes rapidly disappeared.

References.—[1]*Ther. Gaz.* 1911, 533; [2]*Jour. Amer. Med. Assoc.* 1911, i. 486; [3]*Ibid*, Feb. 18.

CACTUS.

Conflicting statements have been made regarding the value of this drug as a cardiac tonic. Various manufacturing houses have preparations both of the whole drug and of alleged active principles. Hatcher and Bailey[1] have tested the pharmacological action of fresh tinctures made by them, and of many of the commercial preparations. Their findings do not favour the statements made by those who claim that cactus is an efficient substitute for digitalis. They were unable to obtain any experimental evidence that true Mexican *Cactus grandiflorus* possesses any pharmacological action whatever, and state that it is singularly inert, whether administered by the mouth or vein. Colossal doses by the vein sometimes, but not always, exert an extremely feeble action on the heart, but no perceptible action was obtained when it was administered by the mouth. This agrees exactly with the results of the experiments on animals, healthy men, and on patients by Lyons and Qualls[2] with two cactus preparations, cactina

(Sultan) and cactus (Abbott). With neither preparation could any action be demonstrated.

[The above statements add proof to the failure of the pharmacological method in arriving at the therapeutic value of drugs. In large doses cactus grandiflorus is a cardiac poison closely resembling aconite in its action. In small doses, say 2 to 4 min, of the tincture, it is one of the most valuable remedies we possess in cases of overaction of the heart, such as we meet with in hypertrophy and in functional disorders. A characteristic indication is a feeling of constriction about the præcordia. In functional palpitation attended by pain it is of great value. It is of less use in tachycardia, where apocynum is the better remedy.—*Ed.* MED. ANN.]

REFERENCES.—[1]*Jour. Amer. Med. Assoc.* 1911, i, 26; [2]*Ibid.* 1910, ii. 455.

CHIRALKOL.

Under this name a solid alcohol soap has been put upon the market, with the view of providing a ready means of carrying alcohol for use in military surgery. Chiralkol is a doughy white soap, in which, according to the manufacturers, 86 per cent of alcohol is combined either with nut fat, cocoa fat, or palmitin; but Kutscher found that the content in alcohol was over-stated, and that the quantity varied from 72 per cent to 82 per cent. The mode of using the preparation is as follows: After carefully cleansing the hands with soap and water, the soap is washed off, and without drying the hands one piece of chiralkol is rubbed on with gentle pressure. The chiralkol dissolves, forming a soapy alcohol covering. When this begins to dry, a second tablet of chiralkol is rubbed on, and subsequently a third. This process takes about five minutes, and when completed the soap is washed off with some sterile fluid. Kutscher found in a series of experiments that by the use of chiralkol a fair disinfection of the hands could be obtained. In twelve experiments the diminution in the germs after the application in nine cases was 96 per cent, and in six of these cases over 99 per cent. He does not think that the action penetrates very far. On the whole he considers chiralkol disinfection inferior to that obtained with alcohol.

REFERENCE.—[1]*Berl. klin. Woch.* 1911, Ap. 24.

CHLOROMORPHINE.

Chloromorphine is formed as an intermediate body in the conversion of morphine into apomorphine, when the former is heated along with HCl in a sealed glass vessel. The first stage of the process consists in the replacing of an OH group in the morphine by an atom of chlorine. This body, chloromorphine, on further heating is converted into apomorphine by the separation of HCl. Two isomers of chloromorphine occur, and their clinical action has been investigated by Grund.[1] His clinical experiments were broken off after an unfortunate experience, in which the injection of 5 mgrams of the α-chloromorphine produced a paralysis of the respiratory centre within ten

minutes of its administration. By artificial respiration the patient was brought round in about a quarter of an hour. The limited experience indicates that chloromorphine acts similarly to morphine, but is less reliable as a sedative. It is interesting to note that impure apomorphine is apt to contain some chloromorphine, and it is possibly to this contamination that the occasional unexplained toxic action of apomorphine upon the respiratory centre is due.

REFERENCE.—[1]*Münch. med. Woch.* 1911, 1907.

CHRYSAROBIN.

Unna,[1] in an interesting article, discusses the therapeutic action of this drug. He points out that chrysarobin may act as such; or as a reducing agent, the process of oxidation being the essential point in the therapeutic action; or, lastly, it may be that neither the original substance nor the process of oxidation, but the final product of the oxidation process, which is the real active substance. It has long been known that chrysarobin can be oxidized into chrysophanic acid in the presence of alkalies; but this is not the product which is the active remedy. It is usually supposed that the oxidation depends on the presence of H_2O_2 in the secretions, but Unna puts forward a new theory, that the specific oxidation of chrysarobin is due to the presence of oleic acid. Chrysarobin oxidized by oleic acid or siccatif (heated linseed oil) in the absence of free alkali gives rise to a new body, oxychrysarobin, with a characteristic spectrum differing from the oxidation product (chrysaloxin) got by conducting a stream of air through an alkaline solution of chrysarobin. He finds that on **Psoriasis** patches treated with non-alkaline chrysarobin ointments the chrysarobin is converted into oxychrysarobin, while if an alkaline ointment is used chrysaloxin is formed. He therefore advises the use of chrysarobin siccatifs or ointments containing oleate of lead to facilitate the formation of the active oxychrysarobin.

REFERENCE.—[1]*Brit. Med. Jour.* 1910, Nov. 19.

CLIMATOLOGY.

Luke[1] puts in a well-reasoned plea for the use of hydropathic institutional treatment for certain types of invalids in preference to spa treatment. In the hydropathic institution the patient is under the eye of the doctor. His daily treatment does not necessitate a more or less lengthy and draughty journey to the bathing establishment as is so frequent in spa life. The greater suitability of the hydropathic is manifest in the case, say, of an elderly patient with defective memory, who finds it difficult to find his way about. Another class of case very suitable is that of the person thoroughly run down who finds any movement exhausting. In such a case it is imperative that bath treatment should be carefully watched, lest the patient is exhausted too much to react.

REFERENCE.—[1]*Lancet*, 1911, ii, 427

COLD AIR.

A series of experiments have been carried out intermittently from 1909 at the Liverpool School of Tropical Medicine, with the object of discovering whether cold air retarded the onset or modified the course of certain experimental diseases in animals. For the purpose a special cold chamber was erected which can be kept at any temperature between 15° F. and 150° F. In the experiments the temperature during the day was kept at 20° F., and during the night it was usually between 36° and 38° F. Thomson[1] stated that it was found that the animals kept in the cold chamber were livelier than those in the ordinary animal house, and their nutrition seemed to be favourably affected, as most gained in weight. When rats and guinea-pigs infected with *Trypanosoma gambiense* and *T. rhodesiense* were kept in the cold chamber, the incubation period was increased, and the life of the animals prolonged, while fewer parasites were detected in the peripheral blood. The prolongation of the incubation period was also seen for *T. lewisi* and *T. brucei*, while the life of animals infected with caderas and nagana was prolonged in the cold chamber. In two guinea-pigs kept in the cold chamber after inoculation with tubercle, it was noted that the superficial abscesses which formed at the site of inoculation developed much more slowly than in controls. The dry, cold air of the chamber was stimulating, and people in good health felt more vigorous after a short sojourn in it, while a patient suffering from sleeping sickness said he felt better after.

Reference.—[1]*Brit. Med. Jour.* 1911, Mar. 25.

ERGOT.

The active principles of ergot are gradually being worked out, and a fairly clear conception of the complex constituents of this little-understood drug has been obtained. It contains a specific alkaloid, *ergotoxine*, the hydrate of the inactive crystalline ergotinine. Ergotoxine produces the characteristic gangrene and other toxic effects of ergot, contracts the uterus, arteries, and other plain muscular organs, and, in larger doses, induces selective motor-paralysis of the true sympathetic system. As long ago as 1875 Buckheim suggested that ergot owed its activity to decomposition products of proteins produced by putrefaction. Ergot contains a number of such bases derived from amino-acids, e.g., leucine, tyosin, tristidin, agmatin, by the elimination of carbon dioxide. During putrefaction such bases are frequently found, and ergot, a fungus, is more nearly allied to bacteria than the higher plants ; consequently, these substances are more likely to be found in it than in the drugs which form the source of our vegetable medicinal solutions. Of the various bases found in ergot, two or three have already proved of pharmacological importance. From tyrosin during putrefaction p-hydroxy-phenyl-ethylamine is found by the splitting off of CO_2. This active base is also found in fresh ergot. According to Barger and Dale it is the chief pressor constituent of most aqueous ergot extracts. It produces contraction of the uterus if pregnant, but

not otherwise. After the isolation of this base there still remains unaccounted for the powerful action of certain aqueous ergot extracts in producing contractions of the isolated cat uterus. By a precipitation method it is possible, however, to isolate a minute quantity of a crystalline picrate which possesses this action to an intense degree. The base in question is 4-β-animo-ethylglycoxaline (β-iminazolylethylamine) produced by splitting off CO_2 from histidin. Its physiological activity is very great. A marked contraction of the isolated uterus is produced by 1–25,000,000 parts of Ringer's solution. This base can be obtained synthetically, or by the action of putrefactive organisms on histidin.

As Dale points out, if its clinical value depends upon these amino bases, ergot will probably drop out of the Pharmacopœia, as it will probably be easier to prepare them from other sources.

References.—*Brit. Med. Jour.* 1910, Nov. 19; *Jour. Phys.* xii, No. 5; *Trans. Chem. Soc.* 1910, xcvii. 2592; *Ibid.* 1911, xcix. 339.

EUSAPYL.

Under this trade name a German firm have introduced a watery solution of potassium ricinoleate and chlor-metacresol. The half per cent solution of eusapyl is said to kill virulent staphylococci in a minute, and a 2 per cent solution in 30 seconds, whereas a 1–1000 solution of perchloride of mercury required about thirty minutes. Eusapyl acts even in the presence of albumin. Gottschalk[1] has tested practically the disinfecting power of a 1 per cent solution of eusapyl in 80 per cent ethyl alcohol, and finds that it gives excellent results in **Sterilizing the Hands** of the gynæcologist. The solution is momentarily irritating, but does not damage the skin. He has also used a $\frac{1}{2}$ to 1 per cent watery solution as a douche for the vagina and uterus, and finds this a satisfactory strength.

Reference.—[1]*Deut. med. Woch.* 1911, May 18.

GERMICIDES.

From time to time some enquiring spirit investigates the value of germicides. The results of such investigations almost invariably startle the investigator, and leave him with a wholesome distrust of the much-advertised new remedies. Last year, in the *Medical Annual* a report on the phenol bodies was included. Since then Post and Nicoll[1] have gone into the whole question again, using the following method: Half a cubic centimetre of the solution to be tested was placed in a small test-tube. Into this solution was placed one platinum loopful of an emulsion (in culture broth) of a twenty-four-hour culture (on blood-agar slant) of the organism used. After one minute, ten minutes, thirty minutes, and twenty hours, a loopful of contaminated test solution was thoroughly mixed into a tube of blood-agar and plated in the ordinary sterile petri dishes. These were incubated at 37° C. and observed after twenty-four, forty-eight, and seventy-two hours. In the case of large numbers of colonies the figures are

approximate, and if the number of colonies was too great to permit of approximate estimation, the sign of infinity (∞) was used. The streptococcus was obtained by blood-culture from a case of puerperal septicæmia; the pneumococcus from blood-cultures in a case of typical lobar pneumonia; the gonococcus was isolated from a urethral discharge; the *B. typhosus* was obtained directly from blood-cultures. All the organisms were grown only on blood-agar after being obtained. A number of highly instructive tables summarize the findings.

Their results establish the following points: (1) The reliability of the prompt action of a few simple germicides such as tincture of green soap, alcohol in solutions above 50 per cent, silver nitrate solutions as dilute as 1–1000, the iodine solutions either as the tincture or in aqueous solutions with potassium iodide, phenol in 5 per cent solution. (2) The unreliability of many agents prevalently supposed to be effective germicides. (3) The slow action of solutions of mercuric chloride, although when given hours to act, it is effective in high dilution. (4) The economic importance in the choice of germicides. This is of special interest to the managers of hospitals, since there is a great difference in expense between furnishing the much-advertised high-priced (yet less effective) articles in concentrated solutions, and the simple cheaper (yet more efficient) articles in higher dilutions. In one hospital alone, where advantage has been taken of this difference, the saving has been several hundreds of dollars a year, with increased efficiency.

GLUTANNIN.

Glutannin is a compound of tannic acid and plant albumin. Roos, who introduced the compound, claims that the albumin portion is split off in the intestine, and that the albumin so freed is less apt to decompose than the albumin contained in tannin-albumin preparations made with animal albumin, as it is split up with difficulty by the intestinal juices. Devaux[1] finds glutannin a useful astringent in **Diarrhœa.** He usually gives two or three tablets, each containing 0·3 gram glutannin three or four times in the day, and directs the patients to chew them well. The preparation is readily taken and does not upset the stomach. It acted well, the liquid stools usually becoming firm in two or three days. He found it useful in **Intestinal Tuberculosis.**

Reference.—[1]*Münch. med. Woch.* 1911, 1727.

GLYCERIN.

Burges[1] has used pure glycerin as a cheap substitute for antiphlogistine, and has obtained very satisfactory results in **Phlegmons of the Fingers, Chronic Eczema, Carbuncle,** etc. He applies the glycerin on lint or gamgee covered with guttapercha tissue. He considers that the action depends upon the marked hygroscopic properties of glycerin. MacLennan[2] used glycerin intraperitoneally in two cases of severe **General Peritonitis.** In both cases, after washing

out the peritoneal cavity with saline, etc., the operation was completed by passing about one pint of pure sterile glycerin into the peritoneal cavity, ample drainage being provided for by several openings. The glycerin was intended to extract fluid plus toxins from the peritoneum. For the first forty-eight hours the one patient was very drowsy, and on the second day a well-marked urobilinuria appeared, lasted for two days, and then passed off gradually. The general condition rapidly improved, and the subsequent course as regards the peritoneum was entirely satisfactory. In the other case the peritoneum also seemed to do well, but the kidneys failed to respond, only about 4 oz. being passed on the second and third days. There was no hæmoglobinuria. The glycerin did not give rise to the kidney condition, but it must be borne in mind that the passage of glycerin through a kidney irritates it, and in this case the kidneys were in a diseased condition to start with, so that the glycerin could be accredited with the suppression. He thinks that in desperate cases of general **Peritonitis** glycerin in large quantities has a most beneficial action, but it must not be forgotten it is highly toxic. In **Tuberculous Peritonitis** it must be used with the greatest care.

REFERENCES.—[1]*Pract.* 1911, 243; [2]*Brit. Med. Jour.* 1910, Dec. 10.

GOSSYPII CORTEX.

Scott has investigated the action on the uterus of this drug, which is frequently used as an emmenagogue and abortifacient. He finds that the extract, dissolved in Ringer's solution, increases the strength of the uterine contraction and its tonus. The action lasts some time. It can be demonstrated both on strips of the excised pregnant uterus of the cat and also on uterus *in situ* with the blood and nervous supply intact. He thinks that possibly this drug may prove of clinical value where it is desired to increase the contracting power of the uterus.

REFERENCE.—[1]*Ther. Gaz.* 1911, Mar. 15.

HARROGATE WATERS.

As the result of experiment on approximately normal individuals, Brown[1] concludes that the strong sulphur water of Harrogate exerts a profound effect upon metabolism. It stimulates the action of the bowel and increases diuresis. The total nitrogen and phosphate output of the urine is increased by 8 and 10 per cent respectively. Under the action of the sulphur water, hypoxanthin administered to persons on an otherwise non-purin diet is more thoroughly oxidized to uric acid, and the uric acid is more rapidly excreted. Brown holds that these actions indicate an enormous stimulation of the xanthin oxidase of the liver. The explanation of the beneficial action of the water in **Gout** and **Arthritic conditions** may possibly be due to this general stimulation of the metabolism.

REFERENCE.—[1]*Brit. Med. Jour.* 1911, June 3.

HEXAMEKOL.

Lüdin[1] reports favourably on the local sedative action of this new drug, a compound of guaiacol and hexamethylene-tetramine, containing ·65 gram guaiacol in each gram. Hexamekol is a white crystalline powder with the odour of guaiacol. It is applied by slowly rubbing it into the skin. Lüdin has found it useful for relieving the pain of **Phthisis** and **Dry Pleurisy.** It is also of use in **Itching Skin Affections,** but must be employed with some caution, as toxic effects may appear. In one case, where the drug was rubbed in over a large surface, he observed slight collapse, the urine turned dark, reduced Fehling's solution, and contained guaiacol.

REFERENCE.—[1]*Münch. med. Woch.* 1911, June 6.

HEXAMETHYLENE-TETRAMINE (Urotropin).

On the ground that this drug is excreted by the bronchial mucous membrane, by the saliva, and by the middle ear, Miller[1] advocates its use in the treatment of **Common Colds.** In most cases it acts promptly. The watery irritating secretion of coryza ceases, and in influenza the fever, aching, and malaise stop. It should be used at the earliest possible moment, as soon as the nose begins to feel stuffy, in doses of 15 gr. four times in the twenty-four hours. To obviate any tendency to irritation of the bladder, large quantities of fluid should be drunk. Landis[2] considers the drug likely to prove of value in the treatment and prophylaxis of **Bowel Infections,** arising from the presence of gall-stones in **Gall-bladder Disease** and in **Enteric Fever** and post-typhoidal states. Chauffard[3] also strongly advocates the use of hexamethylene-tetramine in the same diseases. It is rapidly excreted in the bile. After small doses of 1 to 1½ grams daily, the excretion in the bile is abundant during the first twenty-four hours, but after forty-eight it could not be detected. The exact form of excretion is not known, but probably it is unchanged. Solutions of ·5 per cent urotropin have considerable antiseptic value, and it is calculated that with 10 grams daily the biliary secretion will contain more than this percentage. Chauffard has obtained excellent clinical results with small doses of 1½ grams daily in **Acute Infective Angiocholitis.** In **Enteric Fever** he advocates the routine daily administration of 2 grams in doses of half a gram. In serious cases the amount may be increased to 3 grams daily. He holds that the relapses in typhoid fever depend upon renewed infection of the intestinal tract with bacilli excreted in the bile. Thus the relapse frequently seen after increasing the diet is really due to the extra food acting as a stimulus to the bile, thereby producing an increased outpouring of the infective germs. In cases of enteric fever treated with urotropin, he was struck with the diminution in the urinary symptoms. Albuminuria is diminished and the indican output is markedly reduced.

REFERENCES.—[1]*Jour. Amer. Med. Assoc.* 1911, June 20; [2]*Prescriber,* 1911, Ap.; [3]*Sem. Méd.* 1911, Mar. 8.

HYDROPYRIN.

A new salicyl compound has been introduced, lithium salt of acetyl-salicylic acid. According to Boruttau,[1] it is freely soluble in water and has a pleasant acid taste. It is a very light crystalline powder, which is only feebly hygroscopic, and can be kept quite well in stoppered bottles or in waxed paper. It is not split up by digestion with pepsin or free acid, but is readily split up with excess of alkali. He ascertained that hydropyrin was much less toxic for rabbits and frogs than sodium salicylate. It is split up in the intestine and absorbed. The urinary excretion begins within an hour, and the bulk of the drug is excreted within the first eighteen hours. It leaves the body in the form of alkali salts of salicylic, salicyluric, and conjugated salicyl-glycuronic acids. In rabbits, hydropyrin produces a transitory increase of blood-pressure followed by a slight fall.

Aspirin is $C_6H_4<^{O.CO.CH_3}_{COOH}$ Hydropyrin $C_6H_4<^{O.CO.CH_3}_{COOLi}$.

Hydropyrin has been used clinically by Fickler[2] in fifty-eight cases. Unpleasant side-actions were not common. In one instance, after giving 4 grams daily for three days, he noted some gastric irritation. In another case a woman complained of buzzing in the ears after two doses of 1 gram each. He found the drug a useful antipyretic, the temperature beginning to fall within the first half hour after administration. It exerts the same specific action as sodium salicylate in acute **Rheumatic Fever,** and **Muscular Rheumatism,** and possesses considerable value as a remedy for **Neuralgic Pains.** It seems to increase perspiration and diuresis. Möller[3] also has been satisfied with the clinical value of the new drug. Its only disadvantage is the production of free sweating.

References.—[1]*Deut. med. Woch.* 1911, Jan. 12; [2]*Ibid.* 1910, Dec. 1; [3]*Ibid.* 1911, Feb. 6.

ICHTHYOL.

Barnes[1] recommends the internal administration of ichthyol in **Pulmonary Phthisis** and other disorders of the respiratory tract. He thinks it is rapidly broken down in the stomach, and stimulates the gastric mucous membrane, promoting a free flow of gastric juice, thus increasing the power of digestion and the assimilation of food. Patients who do well on it, immediately begin to show a greater desire for food, and their appetites improve. It may check the absorption of toxins by acting as an intestinal antiseptic. In large doses it causes some laxative action. He cannot say whether any of the decomposition products of ichthyol are eliminated by the mucous membrane of the lung, but believes that it diminishes the quantity of discharge and hastens the return to a healthy condition, especially in those cases which have recovered from **Acute Bronchitis** but still retain a cough accompanied by profuse expectoration. It acts very well in children. He does not state what dose he advises, but it seems to range from

1½ to 5 gr. He has given as much as 20 gr. thrice daily. It is best given dissolved in peppermint water, to which a little extract of liquorice may be added. He prefers this solution, but says ichthyol can also be given as 5-gr. tablets.

REFERENCE.—[1]*Med. Rec.* 1911, Jan. 21.

INTESTINAL ANTISEPTICS.

In an article[1] dealing with the possibility of intestinal antisepsis, Wood points out that it is still a matter of dispute, owing largely to the inherent difficulties of determining accurately the relative number of intestinal bacteria. In investigating the problem, it is necessary to consider first whether there is any drug of sufficient disinfectant power to influence, in non-toxic dose, the growth of bacteria in a volume of fluid equal to that contained in the bowel; and, secondly, whether any such drug would remain long enough in the bowel to exert its effect. The first of these questions is the easier to answer. Taking Bouchard's estimate, which Wood thinks is too high, the average content of the adult bowel is about 6000 c.c. We have no drug which in non-toxic dose would exert a marked germicidal action on such a large volume of fluid, but it seems possible that several drugs would be able to act, in non-toxic doses, by inhibiting or greatly interfering with the growth of the intestinal bacteria. To kill germs in 6000 c.c. of fluid would require 5 grs. of corrosive sublimate, and nearly an ounce of either phenol or salicylic acid; but the following table shows that much smaller quantities would theoretically be able to inhibit growth.

DRUG.	ANTISEPTIC STRENGTH.	AMOUNT REQUIRED FOR 6000 C.C.
Beta-naphthol	1–10,000	9 grains
Copper Sulphate	1–1100	80 ,,
Chloride Water (U.S.P.)	1–16	12 fluid ounces
Creosote	1–3000	30 minims
Phenol	1–700	3 drachms
Salicylic Acid	1–1000	90 grains
Solution of Formaldehyde (U.S.P.)	1–2800	31 minims
Resorcinol	1–2000	45 grains
Thymol	1–1500	60 ,,
Phenyl Salicylate	1–800	*115 ,,

* This figure is calculated from the content of carbolic and salicylic acids, but Bouchard by actual experiment found that only 75 gr. of salol were required.

In actual practice the question of absorption would prove of importance. It is known that many of these drugs are absorbed from the intestine, while the evidence is not satisfactory that any of them tarries for a considerable period in the intestine. Of course the drugs do not immediately come into contact with the whole of the contents of the bowel, but many are absorbed so quickly that they probably never pass far down the intestinal tract. From a review of the direct

experimental evidence obtained in a limited number of observations on animals and man, Wood concludes that it is possible to influence the growth of the intestinal germs. The drugs which appear most suitable are beta-naphthol, formaldehyde, and creosote; though the last two are so rapidly absorbed that they would probably only act in the duodenal region. Beta-naphthol is very sparingly soluble, and probably lingers in the intestines for a long period. It is efficient as an antiseptic in weak dilution, and seems to be the remedy of choice in all cases where we wish to influence the growth of bacteria beyond the duodenum.

Reference.—[1]*Ther. Gaz.* 1911, Mar. 15.

IODIDES.

Matthew[1] finds that in **High Arterial Tension** without arteriosclerosis, iodides have a marked hypotensive action. They do not exert this action where there is arteriosclerosis. To obtain the vasodilating action, the iodides should be administered in the form of potassium iodide, with an initial dose of 10 grs., which may be rapidly increased if necessary. Organic iodine compounds are not satisfactory vasodilators, probably because they contain too little iodine. (*See also* Blood-pressure.)

Reference.—[1]*Edin. Med. Jour.* 1911, Mar.

IODINE.

Since Grossich,[1] in 1908, pointed out the value of a 10 per cent tincture of iodine as a means of **Sterilizing the Skin** in lacerated wounds, this method of treating the skin before operation has been extensively employed, and has been favourably received by surgeons all over the world. The chief merit of the procedure is its simplicity. Without any preliminary treatment, such as shaving or washing, the iodine solution is applied to the skin and allowed to dry. It may be applied twice, but most operators seem to find one coat satisfactory. It is not permissible to use water to wash the part before the iodine is applied, as the water makes the superficial cells swell and become sodden, thus preventing the iodine from penetrating into the crevices. It is not even necessary to shave the part, unless this can be done some hours before the operation, so that the part may become thoroughly dry before the iodine is applied. In emergency operations, where shaving is desirable, it is best to cut the hairs very short with scissors, and then use a very sharp safety razor without water. As both the application of the iodine and the preliminary shaving take place after the patient is anæsthetized, the process is not painful. The great advantage of the iodine sterilization of the skin is the simplicity, efficiency, and economy of the method.

It is, however, not free from slight drawbacks: occasionally the skin is irritated by the iodine, and dermatitis may be produced: the vapour of iodine may cause troublesome irritation of the nose and eyes of the surgeons. Waterhouse[2] points out that this irritation is much less if the tincture is made with rectified spirit instead of methylated spirit, and

this is endorsed by Evans[3] and Hamilton.[4] Many surgeons have tried to diminish the skin irritation by using dilute solutions. Grossich's original solution contained 10 per cent of iodine, but much weaker solutions seem effective. Evans[3] uses 1–80, which he says is strong enough for ordinary cases. A good average strength is 2·5 per cent as in the B.P. tinct. iodi which is employed by many surgeons. That it is a satisfactory strength to use is shown by the excellent bacteriological results obtained by Turner and Catto.[5] In a series of thirty-two cases, sterilized either with the tincture or with a solution of iodine 30 grams, pot. iod. 40 grams, aq. destil. 500 c.c., which is mixed before use with an equal quantity of methylated spirit (so that the strength of the solution is 3 per cent iodine), they removed thin strips of the whole thickness of the skin immediately after the first incision, and cultivated them in nutrient broth for seventy-two hours. The series of thirty-two cases were sterile, except in three instances, where skin from the scrotum and inguinal region showed growth of *Staphylococcus albus*.

These results are much better than those got by Decker,[6] who found that two applications of 10 per cent tincture of iodine were very unreliable in their action, and in most cases excised pieces of skin or scrapings from the iodized surfaces gave growths in bouillon. The clinical results were satisfactory, so that he concludes that the effect is due, not to extermination of the germs in the skin, but to some tanning process, due to the combined action of the alcohol and iodine, which prevents the germs contained in the skin from being shed. Decker has given up the iodine sterilization after using it in upwards of 800 cases, as he finds that it is too irritating to the mucous membranes of the staff. Various plans have been suggested to remove the staining from the skin. Washing with absolute alcohol is not very efficient. Snoy[7] recommends sodium hyposulphite, but Decker[6] found that this was liable to be followed by eczema.

To increase the *penetrating power* of the iodine, it has been suggested that it should be dissolved in some fat solvent. Benzene has been suggested, but it only takes up about 0·1 per cent of iodine. According to McDonald[8]—who tested solutions and combinations of the following solvents, alcohol, chloroform, benzene, acetone, ethylene dichloride, toluene, glycerin, and carbon tetrachloride,—the following mixture is the best: iodine 2 parts, carbon tetrachloride 98 parts. He has used it for three years with uniformly good results if rubbed on for one or two minutes with a gauze swab. The mixture dries readily. Tetrachloride is itself an antiseptic substance, and as it is a fat solvent, it enables the iodine to penetrate into the tissue, while it is not irritating to the skin. Aubrey[9] found a solution of 2 parts tincture of iodine in 3 parts of ether give excellent results in the slight wounds which are constantly happening in a large asylum. Lewis[10] recommends tincture of iodine as an application to the **Umbilical Cord.** After cutting the cord, blood and vernix caseosa are wiped off, and the iodine is applied till the cut end of the stump, the ligature, and the

attachment, are stained deeply. When the cord separates, the denuded surface is touched with the tincture. Woodbury[11] finds iodine a most reliable antiseptic. He was one of the first to introduce it into America, and has used if steadily since 1906. For **Washing-out Cavities,** for **Douching** the uterus or vagina, a teaspoonful of the tincture in a quart of physiological saline solution makes a satisfactory strength.

Pfannenstill[12] advises the use of nascent iodine in **Tuberculous Lesions of the Lungs** and **Upper Air Passages.** To obtain the local action of the nascent iodine, sodium iodide is administered by the mouth, and ozone generated by electricity is inhaled immediately afterwards. The treatment, which lasts from one to three hours twice daily, is not unpleasant, and is said to give good clinical results. Pfanennstill advises that the daily quantity of sodium iodide administered should not exceed 4 grams, and that not more than 2 grams should be given in each dose. These claims met with considerable criticism at the hands of Bratt and Arnoldson,[13] on the ground that his cases of lupus and throat ulcers were not above the suspicion of being syphilitic in origin.

Moschcowitz[14] finds the most easy and effectual way to prepare *catgut* is as follows. Wind ordinary catgut on glass spools, in a single layer, with both ends fastened to prevent unravelling. Then place for five days in a 5 per cent alcoholic solution of iodine in a tightly closed vessel (museum jar). On removal, spread out on a sterile towel, covered by another sterile towel to facilitate drying, and finally store in a sterile retainer. By this simple procedure an absolutely sterile catgut is obtained, which it is impossible to infect by ordinary means, and does not irritate the tissues. It is superior in tensile strength to gut prepared by other methods.

REFERENCES.—[1]*Centr. f. Chir.* 1908, 1289; [2]*Lancet,* 1910, Ap. 16; [3]*Ibid.* 1911, Jan. 7; [4]*Ind. Med. Jour.* 1910, Oct.; [5]*Lancet,* 1911, Mar. 18; [6]*Deut. med. Woch.* 1911, June 8; [7]*Ibid.* 1911, Jan. 26; [8]*Brit. Med. Jour.* 1910, Oct. 1; [9]*Jour. Amer. Med. Assoc.* 1910, Dec. 24; [10]*N.Y. Med. Jour.* 1910, Dec. 3; [11]*Ann. Surg.* 1911, Jan.; [12]*Allm. Sv. Lakastiden.* 1910, 572; [13]*Ibid.* 1910, 735; [14]*Hygeia,* 1910, 472.

IOTHION.

Wesenberg[1] has investigated the absorption of iothion from the rectum. His conclusions are as follows. In suppository form the drug is rapidly absorbed, and iodine appears in the urine and saliva within a quarter of an hour. Suppositories containing 0·15 to 0·25 gram in 2 grams of oleum theobromatis are usually well borne by the bowel. He is able to confirm the statements of other observers that iothion is readily absorbed when applied to the skin. After absorption a little of the iodine passes into the milk.

REFERENCE.—[1]*Deut. med. Woch.* 1910, Nov. 17.

LEUCOCYTIC EXTRACTS.

Alexander, Nauss, and Williams[1] have done some experimental work with a leucocytic extract, prepared by injecting a 10 per cent sterile suspension of Mellin's food into the pleural cavities of rabbits.

After twenty-four hours the exudate produced is removed, centrifugated, and the leucocytic sediment separated. The sediment can then be washed and used with the leucocytes alive (Pettersson's method), or killed by subjecting them to the action of distilled water and cold (Hiss and Zinsser's method). Experiments with Pettersson's living leucocyte extract, obtained from rabbits, showed that the inoculation of the extract at the same time that guinea-pigs are infected with anthrax has a markedly protective action, either saving the lives of the animals, or prolonging life for periods of several days. The protective influence of the leucocytic extract inoculated at varying periods after infection is still manifest, four out of ten guinea-pigs escaping alive. Another lived for several weeks, and no anthrax was found post mortem, and another lived two days longer than the controls. In the other four animals, no protection was obtained. They find that the injection of the extract produces a leucocytosis which is chiefly polymorphonuclear in character, and occurs regularly within four hours. They have treated sixteen cases of human disease with leucocytic extract obtained by the Hiss method. These cases include chronic acne (1), acute and chronic staphylococcic infections (6), streptococcic infections (3), pneumococcal infections (3), trypanosomiasis (1), anthrax (1), B. coli infection (1). Of these the **Staphylococcal and B. Coli Infections** reacted most favourably to the treatment, the pneumococcal fairly well, and the streptococcal hardly at all. In doses of 10 c.c. there is at once produced a lowering of the temperature (sometimes preceded by a slight rise) and a marked amelioration of the toxæmic symptoms. The patient becomes more comfortable, and delirious patients become more rational and clear-headed. Any chronic discharge becomes reduced. The injection produces no local discomfort. The action is non-specific, and there are no known contra-indications to the use of the extract. In a later paper[2] Alexander gives the clinical details of ten of these cases ; but as he himself says, these cases do not present any striking successes at first sight. Many of the cases were in a hopeless condition when handed over for treatment, and it was difficult to obtain permission to persevere with it. It is possible that the extracts may themselves be bactericidal and bacteriolytic to some slight extent, and that they may contain natural anti-endotoxins, but Alexander considers that the extract acts chiefly as a leucocytic stimulant, inducing a huge outflow of cells, whose function is to protect the body from infection.

REFERENCES.—[1]*Liver. Med.-Chir. Jour.* 1911, Jan. ; [2]*Brit. Med. Jour.* 1911, Feb. 18.

MERCURY.

Baum[1] points out that after the introduction of large quantities of mercury in syphilis a typical cutaneous reaction takes place, consisting in an increase in the number of the roseolous spots, which become redder and more raised than before. Herxheimer, who studied it closely, concluded that it depended upon the local liberation of endo-

toxins as the result of the specific spirochæticidal action of the mercurial preparation. Similar reactions also occur in other tissues, and Baum states that he has seen them involving synovial membranes, periosteum, and tendon sheaths after the administration of mercury in secondary syphilis.

Reference.—[1]*Berl. klin. Woch.* 1910, Nov. 21.

MERCURY COLLOID.

Stephens[1] believes that in the colloid form of mercury we have a potent therapeutic agent, which at the same time is free from most of, but not all, the disadvantages of ordinary mercury. The preparation in a 1 per cent solution appears as a greenish-brown transparent liquid, without any smell, but with a faint metallic taste. It is non-corrosive and relatively non-irritant, and can be used both internally and externally as a solution containing $\frac{1}{4}$ to $\frac{1}{2}$ per cent. Externally he has used it successfully for **Ringworm of the Scalp** and in **Alopecia Areata.** It is very useful as a mouth-wash or spray for **Oral Sepsis.** In **Diphtheria** a few applications of the spray have produced an effect almost as rapid and satisfactory as antitoxin. For **Tonsillar Patches** of all sorts it is of extreme value, but is not quite so effective in redness or inflammation of the tonsils and pharynx. Internally it is of value in **Acute Gastritis** at all ages, the dose for babies being 3 min. of the 1 per cent solution to a drachm of water, and for adults 20 to 30 min. The great advantage of colloidal mercury is seen in the treatment of **Syphilis.** He has not seen any unpleasant action, such as salivation, sickness, or distaste for food, though one patient taking 6 dr. daily had looseness of the bowels. The best and most striking results are seen in that class of case usually reserved for iodide treatment. In syphilitic nervous conditions it acts well, but is of no value in nervous diseases not due to syphilis.

Reference.—[1]*Brit. Med. Jour.* 1910, Dec. 17.

MORPHINE.

The usual text-book teaching is that morphine is very badly borne by children under one year of age, but a case reported by Wichura[1] shows that this rule is not absolute. A rickety infant three months old was given by an error a solution containing $\frac{1}{2}$ gr. of morphia. Within an hour the child was deeply comatose, and Wichura was summoned. He washed out the stomach, but this seems to have been the only treatment used for the next four hours. At the end of that time he was again summoned, and used caffeine, stimulants, and artificial respiration. The child did not vomit at any period, but had practically recovered by the end of sixteen hours.

Reference.—[1]*Münch. med. Woch.* 1911, 1618.

NOVOIODINE.

Novoiodine is recommended as a substitute for iodoform. According to Polland,[1] it is a compound of formaldehyde and iodine, the hexamethyl-tetramine-iodide $C_6H_{12}N_4I_2$. When split up in contact with

the fluids or secretions of the body, it liberates 32 per cent of iodine and 20 per cent of formaldehyde. Novoiodine is a very fine amorphous, light-brown powder, free from odour. It is very stable when exposed to light, but breaks up on exposure to heat above 80° C. It is almost insoluble in all solvents, and therefore is used diluted with equal parts of talc or bolus alba. It can also be used in suspension in oil, liquid paraffin, glycerin, or collodion. Polland found it an excellent substitute for iodoform in the treatment of **Wounds** and **Ulcers.** It never produced eczema, but even though diluted with talc the application to large ulcerated surfaces is painful. Applied to the mucous membranes of the female genital organs, it produced smarting, and next day the appearance of the mucous membrane resembled that produced by a mild caustic. If the talc was replaced by bolus alba 2 parts to 1 of novoiodine, this caustic action on the mucous membranes was not seen and the drug caused no smarting. Possibly the slight cauterizing action explains the rapidity with which **Venereal Ulcers** heal up under novoiodine applications.

REFERENCE.—[1]*Münch. med. Woch.* 1910, Aug. 9.

OCEAN SANATORIA.

Elder[1] considers that an ocean sanatorium is a possibility, provided a properly constructed and medically equipped ship be utilized. For many reasons sea voyages for invalids in ordinary liners are unsatisfactory: the food is not suitable for invalids, the ships are too noisy, and the invalid accommodation is bad. A properly-equipped hospital ship with a navigating staff subordinated to the medical staff would probably be of great value. The provisioning would be suitable for invalids, and the voyages would be so arranged that the risk of rough weather and extremes of cold or heat would be as much as possible eliminated. The ship becomes a floating hospital and convalescent institution combined, differing only from similar therapeutic institutions on land in the peripatetic nature of its location. From the **Surgical** point of view many cases could quite well be treated at sea. Practically any operation, unless of a very delicate nature, e.g., ophthalmic work, can be carried out at sea. Quite suitable is the ordinary deliberative surgery of everyday hospital practice, e.g., radical cure of hydrocele, hernia, tumours, and chronic appendicitis; excision and amputation of joints, etc.; plastic surgery. **Gynæcological** cases could also be included. After operation many cases would benefit by a voyage in a hospital ship, when they could be kept under medical observation. It is more difficult to lay down regulations about medical cases. **Anæmias,** as a rule, do well at sea. **Syphilis** in all its stages is much improved. Treatment can be steadily pursued while the patient is completely out of the reach of temptation in any form. Arthritic cases almost invariably do badly at sea under existing conditions, and rheumatism also proves unsatisfactory. As regards phthisis, Elder questions whether cases of early chronic pulmonary tuberculosis would benefit. The food is not so good as in land sanatoria, and the

incidence of hæmoptysis is increased both by the constant vibration and the strain of sea-sickness. **Asthmatic** cases can only be treated after careful consideration of the peculiarities of individual cases. **Chronic Bronchitis** and **Emphysema** are often improved by sea voyages. **Heart Cases,** apart from the risk of strain from sea-sickness, are not excluded ; but when there is failing compensation the case should not be sent to sea. **Functional Nervous** cases differ greatly in their response. Many derive no benefit from voyages in ordinary liners, owing largely to the obvious unsuitability of the surroundings, the noise of deck washing, rocking, children's play, etc., all proving disturbing factors. Whether they would benefit by treatment in a hospital ship would depend largely on the care with which the cases were selected. Elder states that simpler cases of **Insomnia,** not due to pain, do remarkably well at sea as soon as the patients become accustomed to their surroundings.

Reference.—[1]*Pract.* 1911, i, 862.

OINTMENTS.

Wild[1] has investigated the pharmacopœial ointments. While many are admirable preparations, others fail to give satisfaction. In many cases this is due to the character of the base. The forty-five ointments in the B.P. are used for the following purposes : (1) protective, (2) emollient, (3) absorbent, (4) sedative and astringent, (5) stimulant, (6) irritant, (7) parasiticidal. The first three of these classes depend on the bases, and the last four on the nature of the active ingredients incorporated with them. To ensure purity and uniformity, the B.P. lays down melting points for the various bases. With the exception of soft paraffin, commercial samples correspond fairly closely to the B.P. standard, but soft paraffin samples varied between 31° and 45° C., while the B.P. melting point is given as 35° to 38·9° C. Wild suggests that two varieties should be made official, one with a melting point 31° to 34°, the other 37° to 40° ; or if one only is retained, it should have a more limited melting point. Apparently those substances which soften gradually at temperatures considerably below their melting points are more useful as bases than those which retain their solidity until the melting point is approached and then liquefy rapidly, e.g., cocoanut and cacao butter. To determine their relative protective and penetrating powers, various bases were investigated, and the results confirm the generally accepted views. Soft paraffin and paraffin ointment appear to be hardly absorbed at all, but remain on the skin as a protective layer for a considerable time. Lard and olive oil are absorbed to a considerable extent—about 15 per cent—after two minutes rubbing ; hydrous wool fat to the extent of 20 per cent, provided the proper proportion of water is used, but old samples partially dried are less absorbed. Owing to its powerful adhesive properties, no reliable result was obtained with anhydrous wool fat. The greatest absorption took place with a mixture of equal parts of glycerin of starch and hydrous wool fat, which is a useful base when a comparatively non-greasy emollient is required.

Protective Ointments.—Soft paraffin is the most suitable base, but in warm weather becomes too soft and runs easily. The official paraffin ointment is not satisfactory ; it easily becomes granular, and then contains small particles of hard paraffin. Lassar's paste, one part each of starch and zinc oxide to two parts of soft paraffin, would be a useful addition to the B.P. for preparing the ointments of boric acid, salicylic acid, glycerin of subacetate of lead, and ointments intended only to act upon epidermis. Sulphur, resorcin, phenol, tar, and other drugs can be incorporated with this base. A good protective base of a softer consistence, which keeps well and does not run, is obtained by mixing one part of hydrous wool fat with three parts of soft paraffin.

Emollient Ointments.—The official rosewater ointment is admirable, but does not keep well, as water is apt to separate out, especially on attempting to incorporate active drugs. The addition of a little wool fat, borax, or a quantitative alteration of the formula is recommended. The spermaceti ointment is the only firm emollient base in the B.P., but is somewhat expensive. A comparatively non-greasy emollient is made with equal parts of hydrous wool fat and glycerin of starch.

Absorbent Ointments.—Hydrous wool fat and lard fulfil all requisite purposes.

He suggests some alterations in the various *official ointments.* Ammoniated mercury ointment, at present 10 per cent, is too strong, and 5 per cent would be better. Instead of the official paraffin base, a lard or simple ointment base would be more suitable and gives more rapid therapeutic results. The red mercuric oxide ointment used for pediculi is better made with lard or simple ointment than with the paraffin base. Calomel ointment should be increased in strength from 1–10 to 1–3 or 1–5. The present mercuric oleate ointment is less active and penetrating than the old 1885 oleate made by combining mercuric oxide and oleic acid. A 20 per cent oleate made in this way keeps well and can be diluted for use. Tar ointment is too hard, and is difficult to combine with other substances. The ointment of glycerin and subacetate of lead is often irritating, but the ointment of the strong solution of the subacetate of lead made with a wool fat and soft paraffin base is a more useful preparation. Instead of the little-used acetate of lead ointment, the glycerin of the subacetate might be combined with Lassar's paste. The consistence of capsicum ointment might be improved ; the belladonna ointment is too strong. Paraffin, conium, eucalyptus, lead acetate, lead carbonate, and potassium iodide ointments should be deleted.

REFERENCE.—[1]*Brit. Med. Jour.* 1911, i, 161.

OPIUM.

The mechanism by which opium exerts a beneficial action in cases of **Diabetes** is unknown. It is usually administered with the object of reducing the volume of the urine and the quantity of sugar contained in it. Landergren[1] states that in addition to these two actions, in

certain cases opium markedly reduces the amount of acetone and oxybutyric acid excreted in the urine. He therefore claims that in cases of threatening coma opium may prove valuable by diminishing the acidosis.

REFERENCE.—[1]*Nord. med. Ark.* 1910.

OVARIAN EXTRACT.

Einhauser[1] finds that in many cases the administration of oophorin, an extract of the fresh ovarian tissue of cows and sows, gives considerable relief from troublesome **Menopause Symptoms** which may develop either naturally or prematurely after the removal of the ovaries. The remedy is not absolutely certain in its action, and it is impossible to predict in what case it will prove valuable. This can only be determined by testing it in each individual case.

REFERENCE.—[1]*Münch. med. Woch.* 1911, Feb. 14.

OXYGEN.

According to Schmidt and David,[1] residence in a high altitude produces constant change in the composition of the blood, viz., increase in the number of red corpuscles and, subsequently, an increase in the hæmoglobin. In addition, metabolism is affected, and the body retains nitrogen. These effects they ascribe to the diminished partial tension of the oxygen in rarefied air. Lessened atmospheric pressure is also a feature of high altitudes, but from a therapeutic point of view this factor is the cause of the unpleasant symptom of mountain sickness and similar circulatory disturbances. To facilitate the utilization as a therapeutic agent of the stimulating effect of reduced oxygen tension, they have constructed a small box chamber, which can be fixed hermetically over the head and neck. By a special valvular mechanism the oxygen can be extracted from the contained air to any desired proportion. They state that this apparatus is suitable for treating **Anæmias** and certain **Pulmonary Conditions.** The patients breathe the oxygen-poor air for hours at a stretch without suffering any circulatory or respiratory embarrassment, though, as a rule, they become sleepy and feel slack. The authors claim that simple anæmias rapidly improve ; the corpuscles increase in number, and the hæmoglobin improves more slowly. In other forms of anæmia, e.g., pernicious anæmia, the same beneficial influence is seen ; but in these cases the colouring matter and the number of the corpuscles rise simultaneously. Whereas excessive quantities of oxygen produce inflammatory changes in the pulmonary tissue, diminished oxygen supply is said to produce a hyperæmic condition. The authors claim that the voluntary production of this hyperæmia is of therapeutic value in **Asthma** and in **Bronchitis** associated with emphysema. Whether or not the diminished supply of oxygen stimulates the production of blood, it seems clear, from an exhaustive paper by Dürig,[2] in which the modern work on the effect of high climates is discussed, that the theoretical foundations of Schmidt and David are insecure. As regards the apparent increase

of red blood corpuscles when a high altitude is reached, Dürig points out that the increase may be merely due to a redistribution of the blood. It takes place very rapidly, even during a balloon ascent, and promptly disappears on reaching the level. At no stage do young forms or nucleated red corpuscles appear in the peripheral blood, nor is the disappearance of the increase associated with jaundice or an increased output of N, S, or Fe in the urine, as one would expect if the blood were being destroyed.

References.—[1]*Münch. med. Woch.* 1911, 939; [2]*Wien. klin. Woch.* 1911, 621.

PANTOPON.

The physiological action of this preparation of the total alkaloids of opium has been the subject of investigation by Bergien and Loewy. It seems clear from their experiments that pantopon differs in its action from morphia. It is known that several of the alkaloids contained in opium exert a stimulating action on the cord and medulla, and in pantopon we find the pure morphine action modified by the presence of these other alkaloids. Thus Bergien finds that the narcosis produced by pantopon is less profound than that produced by corresponding quantities of morphine in both the rabbit and dog. Further, pantopon exerts practically no effect on the circulation and depresses the respiratory centre to a markedly less degree than morphine. The number of the respirations is reduced by both pantopon and morphine, but with the former the reduction is less marked and does not last so long. If the volume of air expired in a unit of time is measured, it is found that the reduction which follows the administration of morphine is much greater than that which follows a corresponding quantity of pantopon. Bergien accordingly comes to the conclusion that there is much less danger of deleteriously influencing the respiratory centre by pantopon than by morphine. Loewy[2] comes to practically the same conclusions as the result of certain experiments on dogs and healthy human beings. To test the depressant action of these drugs upon the respiratory centre, he utilized the response of the centre to increased content of CO_2 in the inspired air. With this test he finds that the irritability of the respiratory centre is much less depressed by pantopon than by corresponding doses of morphine alone. Pertik[3] advises the use of pantopon to check the irritable cough of **Phthisis,** to relieve pain, and induce sleep.

Pantopon has been used by Jaeger[1] and Aulhorn[5] in **Midwifery Practice.** Aulhorn found that pantopon alone in doses of 0·01 gram had very little effect in diminishing the pain produced by the contractions of the uterus. On combining pantopon with scopolamine a more satisfactory result was produced. The technique is simple. At the commencement of labour, when the pains become regular and powerful, he injects ·01 gram pantopon and ·0003 gram scopolamine. After the lapse of thirty to sixty minutes this is repeated. This method has been used in 100 cases. Usually, within ten to fifteen

minutes after the first injection the patients feel tired and excitement disappears. Pains are still felt, but as a rule not so markedly as before. After the second injection the patient generally falls asleep between the pains, but can be easily roused, and at each pain shows by her facial expression and occasionally by a slight moaning that she is still conscious. The pain is only experienced at the height of the uterine contraction, and is much less severe than in a normal woman. It is usually described as merely a comparatively slight dragging pain in the loins. This condition lasts for from four to five hours, often longer; as soon as the severe expulsive pains set in, the patient becomes more conscious of the pains, but still remains quite quiet during the intervals. The injections are not always successful, for the following reasons. If injected at too early a stage, the patients are put asleep and the pains become very intermittent and feeble. On the other hand, if the injections are made too late, the severity of the pains prevents the patient getting much benefit. In a certain proportion of cases there is no response to the injections. Still, in about 65 per cent of the cases a satisfactory result was obtained. No deleterious influence was produced upon either child or mother. The pantopon-hyoscine combination does not give so thorough a freedom from pain as the combination of morphine and hyoscine, but, on the other hand, it is much simpler to administer and can be used in private practice. Kolde's[6] experience in over sixty cases was practically similar to that of Aulhorn. Ten cases received pantopon alone, but the results were not satisfactory. The method of combining pantopon with scopolamine acted as follows: Out of 50 cases, in one no result was obtained; in 16 the pain was only reduced; in 21 the sedative action was more marked and the patient passed into a semi-conscious state, while in 8 cases the action was so marked that the patients had absolutely no recollection of the course of events, though in some cases minor operative interference, such as stitching a laceration of the perineum extending into the rectum, was required. He notes that the scopolamine-pantopon had no bad effects upon the last stages of the birth. In particular, the children were not so apt to suffer from asphyxia or oligopnœa as after scopolamine-morphine anæsthesia. The pantopon should not be used till the pains are regular and the os is dilated enough to admit two fingers.

Morphinism. Dornblüth[7] finds that pantopon, despite its relatively high content of morphine, can be used in the treatment of morphinism. In severe cases of morphine habit he gives an injection of ·04 gram of pantopon thrice daily and several tablets of ·01 gram by the mouth. The injections are soon abandoned, and gradually the tablets are diminished. In this way he claims to obtain a cure of the morphine habit in a relatively short period.

In asylum practice pantopon seems to be useful. Favourable reports have been given by Tomaschny,[8] Becker,[9] and Haymann.[10] The latter states that owing to the facility with which it can be

administered subcutaneously, it is useful for obstreperous cases, as it acts promptly. Its chief value is as a sedative. It is specially useful in cases of excitement with terror. The after-effects are not serious, and the patients do not readily become accustomed to the drug.

Ewald[11] found the internal administration useful in **Diabetes Insipidus.**

When given by the mouth, pantopon is said to act more quickly than opium. Sahli[12] advises that if a rapid action is desired it should be given on an empty stomach, but if it is desired to induce sleep, to relieve pain, or to stop cough, it should be administered after food, as then it produces less action on the bowels and its constipating effect is less marked.

References.—[1]*Münch. med. Woch.* 1910, Nov. 15; [2]*Ibid.*; [3]*Deut. med. Woch.* 1910, No. 36; [4]*Centr. f. Gynaek.* 1910, No. 46; [5]*Münch. med. Woch.* 1911, Mar. 21; [6]*Ibid.* 1911, 1499; [7]*Deut. med. Woch.* 1911, No. 15; [8]*Neurolog. Centr.* 1911, No. 3; [9]*Reichs. med. Anzieg.* 1910, No. 10; [10]*Münch. med. Woch.* 1910, No. 43, and 1911, No. 2; [11]*Berl. klin. Woch.* 1910, Nos. 35 and 42; [12]*Münch. med. Woch.* 1910, No. 25.

PERMANGANATE OF POTASSIUM.

The local application of crystals of potassium permanganate has recently been attracting attention. Scobie has used it successfully in cases of **Tuberculous Dactylitis** and in **Tuberculous Fistulæ.** In the former case[1] the local application was painful, but caused a rapid disappearance of the granulation tissue, followed by rapid healing. Neumeyer[2] points out that the local use of potassium permanganate crystals is contraindicated if the lesion is in the vicinity of an artery. He reports a case in which hæmorrhage from an artery took place eighteen hours after the wound was packed with the crystals.

References.—[1]*Prescriber*, 1910, 198; [2]*Ibid.* 205.

PHAGOCYTOSIS.

Lyon Smith[1] records a series of experiments in which he tested *in vitro* the effect of acid hydrochloride of quinine, and of morphia, upon the phagocytosis of various organisms. Using very dilute solutions (1–7000) of quinine, which corresponded to the amounts in the blood after the administration of 10 gr. to an adult of 10 stones weight, he found that there was a marked increase in the phagocytosis of *streptococci*, *pneumococci*, *B. influenzæ*, *B. coli*, and a pseudo-diphtheroid bacillus, but the phagocytosis of *B. tuberculosis* and *staphylococci* was diminished. Smaller amounts corresponding to 2½-gr. doses also, but to a less extent, stimulated phagocytosis, while larger quantities of quinine corresponding to 40- or 50-gr. doses markedly diminished the phagocytosis. In each experiment a quantity of morphia corresponding to $\frac{1}{8}$-gr. dose of morphine hydrochloride was added. (The experiments were apparently not confirmed by administering the doses to man and then checking the results). He thinks his results warrant the administration of small doses of quinine (10 gr.) and morphia ($\frac{1}{8}$ gr.) in the initial stages of the various infections.

Reference.—[1]*Lancet*, 1910, Nov. 5.

PHYTIN.

Phytin is the potassio-magnesium salt of an inosit-phosphoric acid, anhydro-oxy-methylene-diphosphoric acid. Phytin is contained in all seeds, and probably constitutes the form in which the plant embryo obtains its supply of phosphorus. Phytin has been recommended as an appetiser, and according to the recent investigations of Donath[1] it acts well in the **Anorexias of Childhood.** After proving its value by clinical tests on children suffering from tubercle, dyspepsia, rickets, and nervous disorders, Donath investigated the action of phytin on the gastric secretions. By means of a Pawlow's isolated small stomach, she was able to show that in dogs, phytin increased the total quantity of gastric juice secreted by 84 per cent, the free hydrochloric acid by 65 per cent, the total acidity by 66 per cent, while the pepsin was reduced by 4 per cent. The conclusion is that phytin stimulates the appetite by increasing the gastric secretions.

REFERENCE.—[1]*Wien. klin. Woch.* 1911, 1192.

PICRIC ACID.

Ehrenfried[1] has used an aqueous saturated solution of picric acid in upwards of 300 cases. In the treatment of **Burns** he considers it to be the best application. It is cheap, sterile, bland, and unirritating. In contradistinction to most antiseptic solutions, it does not interfere with the growth of epithelium, but seems rather to encourage epidermatization. Ehrenfried carried out a series of experiments in which the comparative antiseptic strength of a saturated solution of picric acid was contrasted with that of a 1 per cent solution of phenol. The organisms used in the test were *B. pyocyaneus* and *Staphylococcus aureus*, and the pool-method of performing the test was used. As the result of his tests, Ehrenfried concludes that a saturated aqueous solution of picric acid is much more rapidly lethal to these test germs than a 1 per cent solution of phenol.

Mitchell[2] confirms Ehrenfried's statement regarding the strong germicidal action of picric acid both in watery and alcoholic solutions. He points out that picric acid has strong osmotic powers, and in aqueous solutions is capable of passing through rubber tissue. Thus, after long operations, the surgeon's hands may become stained yellow, though he uses rubber gloves. He has used picric acid as a means of preparing the skin for abdominal operations. The night before the operation the abdomen is shaved, washed with soap and water, and then picric acid solution, either a saturated 1·2 per cent aqueous solution or a 1 per cent alcoholic solution, is applied. The procedure is repeated just before the operation, but smears taken before the last application were sterile in all the nineteen cases examined. Though the picric acid was applied to large surfaces, no untoward symptoms pointing to absorption were observed.

REFERENCES.—[1]*Jour. Amer. Med. Assoc.* 1911, Feb. 17; [2]*Ann. Surg.* 1911, 230.

PITUITARY EXTRACT.

Aarons[1] considers pituitary extract a valuable preparation which may be used in the last stages of **Labour.** It causes a very good and rapid contraction of the uterus, which lasts longer than when ergot or tyramin is used. He considers that the drug should be looked upon as an emergency remedy, and restricted to cases where, after the third stage of labour, there is **Post-partum Hæmorrhage** or **Inefficient Uterine Contraction.** In post-partum hæmorrhage it has given very good results. Possibly **Placenta Prævia** may be looked upon as an exception to the usual rule that the drug is only to be used after the third stage of labour is completed. Pituitary extract has also given him good results in **Shock** and in **Intestinal Paresis.** In one case of **Subinvolution of the Uterus,** six injections at intervals of one week gave a good result, reducing the size of the uterine cavity from five to three inches. With continuous administration there is the risk of inducing arterial degeneration, but this did not occur in this particular case.

Scott[2] found an extract of the posterior or infundibular lobe of great value in controlling **Hæmorrhage** in a case of uterine carcinoma. Stern[3] finds that pituitrin can bring on **Regular Uterine Contractions** in the last month of pregnancy. The contractions come on within an hour, and last from one to several hours. By repeated doses he was able to induce premature labour in three cases at the thirty-sixth, thirty-ninth, and thirty-second weeks of pregnancy. In the first case spontaneous birth was given to twins ; but in the second case, after the membranes ruptured, there was prolapse of an arm, and the labour was completed by version and extraction. In the third case there was prolapse of the cord after the membranes ruptured, and the child, a breech presentation, was delivered manually. In all three cases the pituitrin required to be given for two or three days before the labour was completed. Bondy[4] tested the value of pituitrin in ten cases of **Delayed Labour** owing to insufficient uterine action. In two cases the pituitrin was unsatisfactory. In the remaining eight cases the results were good. On an average the labour, which had lasted thirty-six hours before the pituitrin was administered, was completed in twenty-eight minutes. The dose employed was 1 c.c. subcutaneously. No unpleasant effects were seen ; the children were all born alive, and the placentæ came away spontaneously. Occasionally there was slight bleeding after the expulsion of the placenta.

Bab[5] has used pituitary extract in eight cases of **Osteomalacia.** The results were somewhat varying. Some cases were absolutely refractory, in others improvement was obtained up to a point, while in others the bone pain diminished, and the patients became more able to walk. One case was apparently completely cured by continuous injections of the extract. Klotz[6] finds that pituitrin raises the blood-pressure, when much blood has been lost, provided that there is enough fluid left to maintain the circulation. In healthy conditions he did not obtain a marked rise. In cases of **Atonic Bleeding from the Uterus** the intramuscular injection of pituitrin produced powerful uterine

contractions within three minutes, and the filling of the arteries seemed better, while, if the lost blood is replaced by saline solution, the blood-pressure is raised. The triple combination of stimulus to the heart, uterus, and vessel walls will secure for pituitrin a permanent place in the treatment of bleeding due to atony of the uterus. In animal experiments he has studied the effect of pituitrin on the lowered blood-pressure produced by the toxins of acute infections, such as diphtheria, pneumonia, and peritonitis. He believes that pituitrin will be found of value in all such clinical conditions where the toxæmia causes fall of blood-pressure. He prophesies a special benefit from its use in **Peritonitis**, as it causes a moderate rise of blood-pressure, while at the same time it stimulates intestinal peristalsis and increases the flow of urine.

In an exhaustive article on the physiology of the pituitary gland, Wiggers[7] points out that our knowledge of the action of pituitary preparations is by no means complete. He summarizes the present knowledge as follows. Developmentally and histologically the pituitary gland is composed of an anterior or epithelial portion, and a posterior or neurogliar portion. The anterior lobe elaborates a secretion that is necessary to life and to normal metabolism and development, but which so far has resisted extraction by various solvents; hence its chemical nature and physiological properties remain unknown. The posterior lobe, which is not of vital importance, contains or secretes a substance which may be extracted by water, glycerin, or salt solution, and resists boiling, but it has not been demonstrated that it is identical with the secretion of the anterior lobe or that it represents its vital principle. The extracts constrict the peripheral vessels (probably by a direct muscular action), thus producing a marked rise of arterial blood-pressure. This constriction is not equally pronounced in all organs, for the renal vessels are, at least passively, dilated during its action. These extracts are generally stated to slow and strengthen the heart, but myographic tracings of the intact and perfused heart indicate a depressing influence to be the most constant and characteristic one, an increase in the amplitude being only exceptionally the case. The slowing, as well as depression, are largely attributable to a direct cardiac action, but the former may be augmented by a vagus effect. Pituitary extract resembles adrenalin in its action only in that it causes a rise in blood-pressure. The manner in which it affects the heart and blood-vessels, as well as the effects induced, are entirely different. In addition to its cardiovascular actions, pituitary extract augments the secretion of urine and inhibits the flow of pancreatic juice; but it has not been definitely determined whether these varied reactions are due to separate substances, to a specific affinity of a single substance for different cells, or whether they are secondary to changes in the circulation.

REFERENCES.—[1]*Lancet*, 1910, Dec. 24; [2]*N.Y. Med. Jour.* 1911, Ap. 1; [3]*Berl. klin. Woch.* 1911, 1459; [4]*Ibid.* 1461; [5]*Münch. med. Woch.* 1911, 1814; [6]*Ibid.* 1911, 1119; [7]*Amer. Jour. Med. Sci.* 1911, 502.

PODOPHYLLIN.

It is well known that inhalation of podophyllin irritates the nasal mucous membrane, and occasionally it has a very serious local irritant action on the cornea. Chiari[1] recently saw this unpleasant ocular action on a chemist, who three days before had been packing a large quantity of podophyllin. There was conjunctivitis with opacity of the cornea, burning and dryness of the eyes with lachrymation and tumefaction of the lids. Photophobia was severe, and the conjunctivæ showed marked chemosis. Each cornea was faintly white and opalescent, owing to a diffuse infiltration. Though the corneal epithelium became semi-opaque and œdematous, there was no actual loss of substance. There was partial anæsthesia and diminution of the reflex. Both pupils were myotic and immobile to light and accommodation. The fundus was normal, tension was not increased, and the lens was transparent. The condition cleared up fairly rapidly, leaving the retina healthy, but there was perhaps some hyperæmia of the disc, and decided engorgement of the veins. The only alteration in vision was an oval absolute scotoma in contact with the blind spot, which seems to have cleared up in ten days.

Reference.—[1]*Ophth. Rev.* 1911, 50.

PROTARGOL.—(*See also* Germicides, Gonorrhœa.)

Chrzelitzer[1] points out that the gonococcus is killed by exposure to a temperature higher than 40° C. He thinks, therefore, that our injections into the urethra should be warmer than 40°. In the case of protargol some difficulty is experienced in preparing the mixture at this heat. If boiled, it becomes oxidized, and is then irritating to the urethral mucous membrane; but if the heat is kept below 100° C. this oxidation does not take place. His plan is as follows: The reservoir of the irrigating apparatus is filled with water at 45° C., and the necessary amount of a solution of protargol is added dissolved in cold water.

Italian writers advocate the internal administration of protargol in cases of **Gastric** or **Intestinal Disturbance.** Cantani[2] uses a solution of two per thousand for washing out the stomach and lower intestine. In using it for the stomach he first washes out the organ with water, and then introduces about a litre of the protargol solution. This is allowed to remain for five to ten minutes, and the stomach is then washed out with two or three litres of water. For application to the bowel the preliminary washing out is unnecessary. The action is partly antiseptic, but probably due principally to the astringent action of the drug on the mucous membrane. In cases of **Obstructive Dilatation of the Stomach** the solution gave great relief to the symptoms of lactic fermentation. It is also indicated in **Gastritis** with a large quantity of mucus in the vomit. The action is even more successful in intestinal conditions. In **Dysenteric** affections the early application of two or three injections of 2·6 per cent solution of protargol

usually effects a rapid cure. He also advises it in **Mucous Colitis** and in the **Enteritis of Phthisis.** The results are so satisfactory in cholerine that he advises a trial in the early stages of **Cholera.**

References —[1]*Berl. klin. Woch.* 1910, Sept. 12; [2]*Gaz. deg. Osped.* 1910, Nov. 17.

SALICYLATE OF SODIUM.

Campbell Stark[1] describes some non-rheumatic conditions in which he has found sodium salicylate of value. In **Nasal Catarrh** he thinks the best prescription to use is:

R	Sodii Salicylat.	gr. x	Spt. Ammon. Aromat.	℥xxx
	Tinct. Bellad.	℥v	Aq. Chlorof.	ad ℥j

For the **Diarrhœa** and **Sickness** of young children, salicylate of sodium is almost a specific. Two grains may be given in water to a child of nine months, and repeated every two to four hours, according to the severity of the case. In most cases vomiting ceases after the second dose, and the stools rapidly become less offensive and abundant. In **Bilious Headache** rapid relief is obtained by using:

R	Sodii Salicylat.	gr. x	Aq. Chlorof.	ad ℥j
	Potass. Bromid.	gr xx		

Every four hours.

Given with an alkali, he has found it of use in **Mumps**:

R	Sodii Salicylat.		Saccharini	q.s.
	Sodii Bicarb.	āā gr. v	Aq.	ad ℥ss

Every two or four hours.

Voelcker[2] points out, in an article on the limitations to the usefulness of salicylates in rheumatic affections, that though they are of the greatest value in reducing the fever, allaying pain, and removing effusion into the joints in cases of **Acute Rheumatism,** yet they have no apparent influence upon the subcutaneous nodules or lesions of pericardium or endocardium. In other clinical manifestations of supposedly rheumatic basis—chorea, purpura rheumatica, erythema nodosum—the salicylate seems to do little good. Glaesgen[3] has tested the effect of alkalies on the albuminuria which is produced by salicyl preparations. He finds that even in healthy individuals they produce slight albuminuria. If, however, along with the salicyl preparation about double the quantity of sodium bicarbonate is administered (but not over 10 grams in the day), the albuminuria disappears. His experiments were carried out in patients suffering from polyarthritis, heart disease, etc.

References.—[1]*Pract.* 1911, Nov.; [2]*Clin. Jour.* 1911, 297; [3]*Münch. med. Woch.* 1911, May 23.

SALVARSAN.

General Action.

The Blood.—Salvarsan seems to exert some influence upon the blood. Almost every observer who has investigated the point finds that a moderate leucocytosis is induced. As a rule it does not exceed 17,000, but in one case over 30,000 whites were found in the cubic

centimetre. According to Sieskind[1] the increase is chiefly polymorphonuclear, though occasionally the eosinophiles are increased. It seems to have no clinical significance. The red corpuscles, according to Klausner,[2] are first diminished, then increased, and along with these changes it is not unusual to observe urobilinuria. In some cases this becomes very marked, and actual jaundice with bilirubin in the urine is seen. Weiler[3] reports two cases where well-marked jaundice developed after intramuscular injections. In the first case a woman received salvarsan on August 11th. Five days later the mucous lesions in the mouth had healed, but four days later still she had gastric irritation with vomiting, followed on August 26th by gastric pain and slight icterus, which then became very intense, and lasted till September 2nd. In his second case, seven days after an injection, jaundice was first noticed without any previous symptoms. It became quite deep, and lasted from September 1st to November 10th.

Blood-pressure.—Sieskind[4] finds that after the intravenous injection of salvarsan there is a distinct fall. It is not very marked, and is unlikely to prove of importance except in cases where the blood-pressure is abnormally low.

Many observers note that the injection of salvarsan is followed by great improvement in the *general health*, with distinct increase in weight; and Lesser[5] uses this as an argument that its action is more powerfully *organotropic* than Ehrlich acknowledges. Lesser points out that the rapid healing over of extensive skin lesions in tertiary syphilis where spirochætes are not numerous may be an arsenic action pure and simple. Buschke[6] finds salvarsan exerts a curative action in malignant syphilis, though spirochætes cannot be demonstrated either in the original lesions or in the lesions produced by inoculating animals.

Absorption.—Fischer and Hoppe[7] found that after rectal administration of salvarsan traces of arsenic were excreted during the first two days, proving that a certain amount of absorption takes place. Blaschko[8] confirms this, but states that the quantity absorbed is too small to be of therapeutic value in syphilis. Similarly, the oral administration proved ineffectual. After subcutaneous injections, Fischer and Hoppe[7] found that the urinary excretion of arsenic lasted for some days. With 0·1 gram the urine was free from arsenic on the tenth day, and with 0·3 gram on the twelfth day. They found the excretion after intravenous injection was more rapid, and the urine was free from arsenic in two or three days. Greven,[9] using the sensitive biological method with penicillium brevicaule, found that the excretion into the urine begins rapidly, and can be shown within an hour after subcutaneous or intramuscular injection. With subcutaneous injections the excretion in the urine lasts from fourteen to twenty days, but with intramuscular injections it is more prolonged. If there is a local necrosis the arsenic is very imperfectly absorbed, and Finger[10] was able to detect it in the urine several months—in several cases five to nine months—after a single intramuscular injection of 0·4 gram. Abelin,[11] utilizing a very delicate colour reaction with alkaline solution

of resorcin, was able to show that salvarsan is excreted in the urine unchanged within five to ten minutes of the intravenous injection. The reaction persists for five to six hours, and from this he concludes that to a certain extent salvarsan is rapidly removed from the body without undergoing any change. Bornstein[12] found that after intravenous injection only a small portion of the arsenic remains in the blood, but a trace can still be demonstrated after eight days. After all forms of administration the arsenic passes into the tissues, which seem to store it up, as considerable quantities can be demonstrated in the liver, spleen, kidney, and muscles, after the arsenic reaction of the blood is negative. The arsenic in the urine is in the organic form, and only a trace is inorganic. In nursing mothers the milk contains traces of arsenic, and the arsenic also passes through the placenta, and has been detected in the fœtus (Welander[13]). Other observers have investigated the excretion of arsenic in the urine after intravenous application. Beveridge and Dunbar[14] found the excretion irregular, the highest being found on the first to fourth days. The urinary excretion ceased in nine to eleven days after a single intravenous dose, and in seven to twelve days after a second dose. Jesionek[15] found arsenic still present in the urine in the fourth week after a single intravenous injection of 0·4 gram. This confirms the observations of Mucha,[16] who found the excretion in the urine completed as a rule by the fourth week after intravenous injection. In a couple of cases he detected arsenic as late as two and a half and three months after the injection. Buschke[6] has seen arsenic in the urine eight weeks after intravenous injection.

Distribution of the Arsenic in the Eye.—This has been studied by Igersheimer[17] and Löhlein,[18] who, however, come to different conclusions. Using Marsh's test, Igersheimer concluded that arsenic is not present in the normal eye of the rabbit after the use of salvarsan, whereas it can be readily demonstrated in the syphilitic cornea. He used these findings to support Ehrlich's contention that salvarsan is parasitotropic, not organotropic, and therefore is found in a tissue which contains large numbers of spirochætes. On the other hand, Löhlein, using the more delicate biological test with penicillium brevicaule, found arsenic in the fluids of the eye within a quarter of an hour of an intravenous injection, and states that it is still demonstrable up to the seventeenth hour. In the corneal tissue it is present from the second to the eighteenth hour after an intravenous injection. After subcutaneous injection the arsenic appears in the fluid of the eye within half an hour, and in the cornea within an hour, and persists for about seventeen days.

Excretion in Milk.—After Taege[19] and Dubot[20] reported cases in which breast-fed syphilitic infants improved on injecting the mothers with salvarsan, it became of importance to determine whether the improvement depended upon the excretion of arsenic or antitoxins in the milk. Both these observers were unable to detect arsenic in the mother's milk, and concluded that the improvement produced in the child depended upon endotoxin being liberated from the destruction

of spirochætes in the syphilitic mothers, with subsequent production of antibodies, which were eliminated in part in the milk. Subsequently doubt was cast upon the statement that no arsenic was present in the milk. Jesionek[21] found appreciable quantities of arsenic in the milk after injection of 0·5 gram of salvarsan. He obtained improvement in one case of acquired syphilis in a child, aged five years, who was fed with the milk of a healthy goat which had been given an injection of salvarsan.

Administration.

Before the intravenous route became universally adopted, many suggestions had been made to eliminate the pain and local necrosis frequently noted after intramuscular or subcutaneous injections. Alt's original solution was alkaline. Michaelis and Wechselmann preferred a neutral watery suspension, which proved rather less painful. Other investigators attempted to avoid the local discomfort and irritation by using oily suspensions. Volk[22] rubbed up the dry powdered salvarsan, without neutralization, with liquid paraffin or olive oil, and emulsified this with a little paraffin oil. Kromayer[23] also used a 10 per cent paraffin emulsion of the unaltered salvarsan. Passini[24] found that to suspend the relatively heavy salvarsan a thicker medium was required, and used a mixture of anhydrous lanolin and vaseline oil. He used either the unaltered salvarsan, or dissolved it in methyl alcohol, or neutralized it with NaOH and acetic acid. He states that in sealed tubes his preparation keeps for some time without oxidizing. A somewhat similar method was used by Schindler,[25] who prepared a 40 per cent suspension of salvarsan in a mixture of iodipin and anhydrous lanolin. Levy-Bing and Lafay[26] suspended the salvarsan in about 3 c.c. of a mixture of 1 part of lanolin to 9 parts of oil of poppy. Burke[27] states that a 10 per cent solution of lanolin in olive oil suspends the drug satisfactorily. Isaac[28] suspends the salvarsan in 6 to 10 c.c. sweet oil of almonds, and injects subcutaneously into the scapular region. To prevent the salvarsan precipitating he adds lard to thicken the mixture, and obtains in this way a firm paste which remains unchanged for weeks. The heat of the hand makes it sufficiently fluid to inject. It is suitable for treating outdoor patients, who receive each week an injection of 0·1 gram salvarsan. This is painless, and more convenient than intravenous administration. The Wassermann reaction becomes negative as a rule after the fourth dose.

Intravenous injection is the method of administering the drug which is now used. It is less painful than subcutaneous or intramuscular injection, and is much less likely to produce local infiltrations or necrosis. According to Mucha the therapeutic action is both less marked and less prompt with intravenous injection than with the subcutaneous or intramuscular injections. A large number of writers describe special forms of apparatus to facilitate injection into the vein ; however, with a little ingenuity it is quite easy to adapt any separating

funnel or infusion apparatus. For intravenous application the drug is converted from the acid hydrochloride into an alkaline salt, which is then diluted either with distilled water (Schreiber) or normal saline solution.

The method is as follows: After scratching the outside of the tube containing the salvarsan with a file, the tube is rubbed first with alcohol and then with ether. Break the tube and pour the salvarsan slowly into a large sterile glass-stopped measuring glass containing about 20 c.c. of warm water (the water must not be poured on the dry powder, as it forms clumps which do not dissolve readily). On shaking, the powder dissolves in the water, giving a clear yellow acid solution, which is neutralized with normal sodium hydrate solution. Each 0·1 gram of salvarsan requires about 0·7 c.c. of the soda solution. On adding the soda a flocculent precipitate is formed which dissolves on shaking, giving an alkaline solution. The alkalinity may be reduced by adding cautiously 10 per cent acetic acid till a faint haze is produced, which disappears on the addition of two or three drops of the soda solution. The solution is then diluted with normal saline, or simply with sterile distilled water (Schreiber) till each 0·1 gram is represented by 40 to 50 c.c. The injection is usually made into one of the veins of the forearm or bend of the elbow. The needle is introduced directly into the vein, or, in very difficult cases on fat people with small veins, it may be necessary to expose the vein and tie the needle in. Notthafft[29] recommends this as the best method to use in every case. As a rule the latter procedure is unnecessary. To render the veins more prominent, a constricting bandage is applied above the elbow, and the skin is scrubbed with ether over the vein selected. A medium-sized needle is used: some prefer a bayonet form as easier to introduce. The needle in this case is furnished with a flat plate or a ring, which rests on the skin, and is used to steady the needle after it is introduced. The chief point in introducing it is to ensure that it remains inside the vein, and does not puncture the lower wall. This is effected by holding the needle almost parallel to the skin, and allowing it to traverse about $\frac{3}{4}$ to 1 inch of tissue before it enters the vein. The entrance of the needle into the vein is shown by blood appearing in the small glass tube which is interposed in the rubber-connecting tube close to the needle. To make sure that the needle is lying correctly, the apparatus is adjusted so that saline solution is furnished. If this runs in without causing any swelling or discomfort, the tap can be adjusted to allow the salvarsan solution to flow slowly in. The injection should take from six to ten minutes, and is completed by allowing some more saline solution to pass, which washes out the last traces of salvarsan from the needle. This is then withdrawn, and the small puncture is sealed with collodion. The temperature of the solution should be about 37° C. Sturmer states that it is better given too cold than too hot, as then there is often seen great flushing of the face and headache. The injection must be given with the patient in the recumbent position, and he must remain so for the next twenty-four hours at least. While

most writers recommend some form of gravity apparatus for inserting the solution, Schreiber advises a syringe connected to the needle by a three-way tap, by means of which the syringe can be alternately filled with the solution from a receiver and emptied into the vein. To avoid the risk of blocking the needle with insoluble grit or splinters of glass, it is advisable to filter the salvarsan solution through glass wool.

Marschalko[30] thinks that ordinary 0·9 per cent saline solution is hypertonic and is the cause of some of the violent reaction symptoms. He suggests as more suitable a 0·4 per cent NaCl solution. It seems very dangerous to inject an acid solution of the salvarsan unless it has been well diluted. Fraenkel and Grouven[31] report fatal results three and a half hours after the injection of 0·4 gram of salvarsan dissolved in 15 c.c. water to which 1 to 1½ c.c. of $\frac{N}{10}$ NaOH was added. Hering,[32] from experiments on animals, concludes that the mere acidity of the solution may produce death from acid intoxication, and calculated the intravenous dose fatal for a man as 0·581 gram of the acid salt; but Notthafft[33] records a case where 0·42 gram dissolved in 200 c.c. of fluid, though not fatal, produced syncope with loss of sight lasting about ten minutes. In this case it was intended to inject 0·6 gram after neutralizing with $\frac{N}{1}$ NaOH, but owing to an error $\frac{N}{10}$ NaOH was used, so that over 0·4 gram remained of the acid salt.

Toxicology.

Reaction at Site of Injection.—It was soon discovered that the injection of salvarsan was apt to be followed by local *tissue necrosis*. Orth demonstrated large quantities of arsenic in the muscular tissue after intramuscular injection, and this has been confirmed by others. Martius[34] has devoted special attention to the question, and concludes that salvarsan, however and in whatever doses applied, produced local necrosis of all the tissues in contact with it, e.g., muscle, fat, fibrous tissue, nerves, and blood-vessels. The necrotic tissue may remain in situ, or may break down and give rise to sterile discharges. It may be expelled eventually en masse as a sequestrum, in which arsenic may be demonstrated for months. It is obvious from these statements that the quantity of salvarsan which is absorbed after an intramuscular injection is variable. Furthermore, as salvarsan is very readily decomposed, it is questionable whether it is advisable to form a local depôt, as the altered products may be toxic. In any case, absorption is imperfect owing to thrombosis of vessels. The risk of infection of the necrosed tissue, either by germs introduced from without or by means of the blood-stream, is important. In one of his cases infection with streptococci caused a thrombosis which spread to the iliac vein from the site of injection in the glutei, and sudden death from pulmonary embolism resulted. He strongly advised the intravenous route injection.

Peripheral Nerves.—These local necroses explain the numerous cases in which *paralysis of neighbouring nerves* has been observed after injections into the subcutaneous or muscular tissue. Several cases of

peroneal or sciatic neuritis have been reported after intragluteal injections (Wechselmann,[35] Sieskind,[36] Schmidt[37]).

Rindfleisch[38] reports a case of very serious injury to the sciatic nerve following intramuscular injection of 0·7 gram salvarsan, given in 10 c.c. of fluid as a weak alkaline solution. The injection was made into the gluteal muscles in the ordinary situation, about 1½ inches above the junction of the external and middle third of Nélaton's line. There was no intense local reaction, but severe pain came on about eight hours afterwards and steadily increased, so that three weeks after the injection there was a typical sciatica, which was specially pronounced in the distribution of the peroneal nerve, with well-marked reaction of degeneration. The peroneal paralysis was still pronounced after the lapse of eight months. A similar case was reported by Hirsch-Tabor. Fischer[39] also noted polyneuritis after injecting 0·3 gram intramuscularly into a baby of eighteen months. The injection caused local necrosis. Within two weeks the muscles of both lower limbs began to show wasting and loss of reflexes. The neuritis seemed peripheral, as the bladder and rectum acted naturally. Despite massage and electrical treatment, the condition had not improved to any extent after a month.

A number of cases have been recorded more or less like those of Bohac and Sobotka,[40] who noticed paralysis of the bladder, absence of knee reflexes, and tenesmus, due in their judgment to a direct toxic action of salvarsan.

Intravenous Injection ; Immediate Effects,—Intravenous injection is usually followed within a few hours by a rigor, or shivering, with rise of temperature. In many cases there is headache, with colic and diarrhœa and a cutaneous rash. As a rule the symptoms are not severe, and pass off in a few hours. In some cases, however, acute collapse has followed. In others, immediately after a second injection the patient develops alarming symptoms resembling those seen in hypersensitiveness to serum: the face swells, and becomes dusky red or cyanosed, the pulse is rapid and feeble, and dyspnœa is marked. Wechselmann suggests that the use of old distilled water may explain some of these alarming symptoms, since it usually contains either living or dead micro-organisms, which on subsequent injection induce hypersensitization to the albumin content. In other cases it has been suggested that the preparation of salvarsan used was decomposed ; but this seems unlikely. The most probable explanation is that the reaction is simply a manifestation of a special idiosyncrasy to the drug. A similar reaction is sometimes noted after aspirin, antipyrin, and other drugs. Hoffmann and Jaffé[41] state that they have seen the syndrome in three cases, each time after the second intravenous injection of salvarsan. To determine whether the patients had become hypersensitive to salvarsan, their serum was injected into guinea-pigs, but without causing hypersensitiveness to salvarsan in the injected animals.

Old preparations are not to be used if they have been exposed to light and air. Eilner[42] reports a case in which old salvarsan opened

fourteen days previously was used, the patient reacting with diarrhœa, syncope, three days' retention of urine, and loss of reflexes.

Venous Thrombosis ; Embolism. — Intravenous injections usually cause no local damage to the vein, but in certain instances local thrombosis is produced which, as a rule, passes off in a few weeks without causing any trouble. In a few cases[43] thrombosis has been noted in veins distal to that injected. One or two cases have been reported where the thrombus has become detached and caused embolism. In one of Herxheimer's and Altmann's[44] cases sudden death resulted from pulmonary embolism originating from a thrombosis of the injected femoral vein. Hoffmann[45] reports a case of fatal central pneumonia following embolism.

Cutaneous Rashes are common after all methods of administering salvarsan. The following forms have been recorded: Urticaria, scarlatiniform eruption, erythema multiforme, erythema exudativum, purpura, herpes facialis, herpes genitalis, herpes zoster. These usually come on soon after the administration of the drug, but Wechselmann[46] drew attention to a late reaction in which the symptoms appear about eight to ten days after. The patient has fever, gastric disturbance, diarrhœa, great thirst, conjunctivitis, and a coated tongue, in addition to the rash, which is usually of a morbilliform type.

These late reactions have also been noted by Goldbach,[47] Weiler,[48] Mucha,[49] etc., and indicate that after salvarsan treatment the patient should be kept under medical observation for at least a fortnight.

Kidneys.—In fatal poisoning, both in animals and human beings, it has frequently been noted that there is extensive parenchymatous degeneration in the liver and kidneys. Clinically, nephritis is occasionally seen after medicinal doses. Gottheil,[50] in ten out of twenty-five cases, observed renal irritation in varying degree after intramuscular injection of Wechselmann's neutral suspension. Red cells appeared in the urine usually about the third day, though in four cases over a week elapsed. The irritation is usually temporary, but in three of his cases hyaline and granular casts appeared and the nephritis persisted till the patient left the hospital, in one instance two months after the injection. In Engman, Mook and Marchildon's[51] case the nephritis lasted over four weeks. The frequency of severe nephritis is less than one per cent of the cases treated. In addition to cases of transitory albuminuria, Weiler[52] saw three of severe nephritis in a total of 500, and Sellei[53] two cases in 350. Weiler's cases came on in from two to three weeks, and lasted in two instances over six months. Both Sellei's cases of latent nephritis became worse, and immediately passed blood and abundant albumin.

Brain.—Cerebral irritation has been occasionally noted after the use of salvarsan. Thus Spiethoff[54] reports a case in which an epileptiform attack developed during the general reaction; and Gilbert[55] saw one on the third day after an intramuscular injection of 0·2 gram salvarsan in a child aged nine years. This was severe, lasted four hours, and was associated with marked cyanosis and small rapid

pulse. Both cases recovered, and it was thought that the symptoms of cerebral irritation were probably analogous to the cutaneous Herxheimer reaction.

A very severe form of cerebral disturbance has been described in a few cases. The symptoms come on within a few days of the administration, and may be so serious as to lead to death. In Fischer's[56] case the clinical history was briefly as follows. A medical man, aged forty, otherwise healthy, was infected with syphilis inside the nostril. When he first came under observation he had a well-marked maculopapular eruption, with positive Wassermann reaction. An intravenous injection of 0·4 gram salvarsan was well borne, apart from some rigor and vomiting. The disease manifestations improved, but as a precautionary measure an inunction cure was carried out. A second intravenous injection of 0·4 gram salvarsan was administered on the fortieth day after the first injection, and was well-borne. But two and a half days afterwards the man became suddenly ill, with cerebral symptoms, mental confusion and excitement, convulsions, and rigidity of the neck and back. Death, on the fourth day after the injection, proved due to acute hæmorrhagic encephalitis. Fischer apparently considered that the lesions were of the anaphylactic type.

Kannengiesser[57] reports a similar case where a severe epileptiform condition with unconsciousness, came on three days after the second injection of 0·5 gram salvarsan. The patient lived for another two days, but remained unconscious, and had muscular spasms in his limbs and rigidity of the neck. Post mortem, minute hæmorrhages were found in the brain.

Almkvist's[58] case ran a slower course. Two days after a single injection of 0·5 gram salvarsan, the patient complained of headache and slight shivering, and on the following morning had severe vomiting. That evening, seventy hours after the injection, he was found in bed unconscious, and very cyanosed. In an hour he partially regained consciousness, but on the following afternoon became excited, and then passed into a comatose condition, with distinct rigidity of the arms and left-sided facial paralysis. Death occurred on the following day. Post mortem, hæmorrhagic encephalitis was discovered.

Cardiac and other Fatalities.—A number of cases have been reported in which death has followed salvarsan administration to patients afflicted with advanced disease of the central nervous system. Ehrlich considers that it is inadvisable to give salvarsan treatment to patients in the advanced stages of general paralysis of the insane. In infants suffering from congenital syphilis the spirochætes are present in large numbers in many organs of the body, and an efficient dose of salvarsan is dangerous, as the destruction of the organisms may lead to a fatal overdose of endotoxin. A third category of case, in which salvarsan treatment is dangerous, is found in cardio-arterial degeneration.

Martius,[59] utilizing the reports sent to Ehrlich, was able to analyze seven cases where there was reason to think salvarsan injections

directly contributed to the fatal result. The majority of these cases showed a combination of myocardial degeneration, narrowing of the coronary arteries, and aortitis; and this trio of lesions appears to form a contraindication to the use of salvarsan. On the other hand, several writers seem to have used salvarsan without difficulty in syphilitic aneurysms, even intravenously; and in angina pectoris with the heart otherwise intact the treatment in many cases afforded relief.

Among the deaths following intravenous use of salvarsan, is one reported by Parkes Weber.[60] A man aged forty-seven, suffering from locomotor ataxia, had, within a few hours after an intravenous injection of 0·6 gram salvarsan, a sharp rise of temperature to 104°, with severe and prolonged collapse accompanied by bilious vomiting, Cheyne-Stokes respiration, and partial suppression of urine. He gradually improved, so that on the second day he seemed out of danger except that the urine contained abundant tube-casts; but on the following day he succumbed to sudden collapse. Post-mortem examination showed acute parenchymatous degeneration of the liver and kidneys.

Therapeutics. I.—Salvarsan in Syphilis.

Primary.—The most favourable field for determining the abortive effect of salvarsan is in early primary cases. Several writers record such series. Knaur[61] treated 14 cases of primary syphilis, and after six months had seen 5 relapses, while another case had still a positive reaction. Out of 18 cases, Isaac[62] had relapses in all except 3. In these three instances the swollen glands slowly subsided and no fresh enlargement developed. The Wassermann reaction became negative in about 100 days. Géronne,[63] in 19 primary cases kept under observation for longer than six weeks, saw 5 relapses. Of the 19 patients, 13 had a positive Wassermann reaction at the beginning of treatment. Of these 8 were rendered negative with a single injection, 3 by a second injection, and 1 by a third. The other 6 cases had a negative Wassermann reaction when treatment was instituted; of these only one became positive, and that only after being negative for six months.

More strikingly in favour of a definite cure are the cases of re-infection recorded after previous salvarsan treatment. Isaac[64] reports such cases. In one case of primary syphilis, the patient infected his wife before he submitted to treatment, and within ten months returned with a fresh chancre. The other two cases were treated in the secondary stage, and became infected again in three and five months respectively. Krefting[65] also reports a case of re-infection of a man thoroughly treated in the primary stage while the Wassermann reaction was still negative. Three months later he returned with renewed chancres, and this time the reaction was positive.

General.—Bettmann[66] draws attention to the effect of salvarsan in producing a modification of the disease. He has frequently noted early cutaneous relapses which most usually occur in the immediate neighbourhood of the original lesion. They are also seen on the

extremities, but are rare on the trunk. At first the lesions are succulent, but in time become dry, spreading at the periphery, and scaly. They are extremely resistant both to general and local treatment. He suggests that these cutaneous manifestations correspond to the "neurorelapses." The resistance to specific remedies may perhaps indicate that this action of salvarsan has produced some change in the spirochætes.

Where blood-supply is bad, lesions heal slowly. This is well seen in large **Indurated Chancres,** where, as Wechselmann points out, the vessels are thrombosed, and therefore salvarsan cannot penetrate. Welander[67] found that though the chancre rapidly heals over, spirochætes are still present in the deeper layers. Werther[68] points out the same thing with regard to ear lesions. Labyrinthitis of the early stages heals promptly, probably because it depends on the spread of the disease from the membranes of the brain to the perineurium or labyrinth; but on the other hand, the tertiary or congenital labyrinthitis heals very slowly, since bones and blood-vessels are involved, and, especially where the condition has lasted some time, degeneration of the auditory nerve follows.

Laryngeal.—The lesions in the mouth and throat yield very rapidly to salvarsan. Frequently the patient becomes able within a few hours to swallow much more easily. A possible danger of using salvarsan in laryngeal cases is obstruction due to a local inflammatory reaction. Chiari[69] reports examples of this. In a series of 15 cases he saw marked swelling come on in 4 cases after one, three, five, and eleven days respectively. The stenosis was not dangerous in any case, but he warns against treating patients *in extremis*, and insists that all cases should be kept under close medical supervision for a fortnight. Under these conditions he recommends salvarsan as a rapidly acting, not dangerous, remedy in syphilitic conditions of the upper air-passages.

Syphilitic and Parasyphilitic Nervous Disease.—In cases where organic degeneration of the central nervous system has taken place, no hope of a *restitutio ad integrum* can be expected, but Treupel[70] in several papers maintains that considerable temporary improvement may be obtained from the use of salvarsan. In his latest paper he gives details of twenty cases which had previously received treatment with mercury and iodides. The salvarsan treatment usually increased the lancinating pain for a few days, after which they were much relieved. In many cases improvement as regards sensation, bladder, speech, and ataxia was seen. There was no alteration in the reflexes. The improvement is temporary, and lasts a considerable time, for weeks or months. On renewing the injections at the end of this stage of improvement, the same benefit is obtained. He was unable to keep records of the serum reactions, except in one case, where no disappearance of the Wassermann reaction was obtained with three injections. He concludes that in tabes the syphilitic lesions are only reached by the salvarsan with great difficulty. The treatment was

as a rule well borne, but in one case the patient died two days after the second intravenous injection, with symptoms of meningeal irritation, and post-mortem examination revealed a hæmorrhagic pachymeningitis with fresh punctiform hæmorrhages in the cord. Against Treupel's on the whole favourable report, we find that Schmidt[71] obtained no diminution of crises in nine cases.

Some observers have noted an improvement in the *mal perforans* of tabes. Isaac[72] saw an ulcer, penetrating to the bone, heal up rapidly, the patient being able to walk again in three days, though otherwise the disease was not improved. Meidner[73] reports three cases of a similar favourable nature. Neuhaus[74] in some cases obtained a return of the pupillary reactions, and thinks that in early cases the drug may do good by removing symptoms which are due to fresh implications of the nervous system. Assmann[75] in four cases out of ten noted a distinct diminution in the lancinating pains after a transitory increase. In no case was any change effected in the condition of the reflexes, sensation, or ataxia.

"*Nerve Relapses.*"—Many observers have reported cases in which lesions of cranial nerves recurred shortly after salvarsan treatment. Finger and some of the Viennese writers held that this indicated a special toxic action of salvarsan, but Ehrlich put forward the explanation ascribing these cases to an incomplete sterilization, whereby certain avascular tissues escaped. The subsequent proliferation of the surviving spirochætes induced local relapses, which in the case of nerves running through narrow bony channels are likely to produce paralysis. Acting on Ehrlich's suggestion, renewed antisyphilitic treatment has been extensively employed in such cases, and as a rule rapidly cures the symptoms. At first it was thought that the frequent involvement of the eighth nerve indicated a special predilection to salvarsan akin to the lesions produced in dancing mice after atoxyl, but Haberman had already, in pre-salvarsan days, published many cases in which similar lesions had been seen. It is therefore generally accepted that Ehrlich's suggestion is correct: that the nerve involvement is a syphilitic manifestation and not a toxic action of the salvarsan.

Though Ehrlich placed the lesions in the nerve-trunks, perhaps it will eventually be found that they are more frequently meningeal in origin. The frequency of these early nerve relapses is apparently greater with salvarsan treatment. Almost every writer who has treated large series of cases records examples (7 cases out of 350 treated—Desneux and Dujardin; 13 in 300 cases—Géronne and Gutmann). Benario[76] estimates their frequency as 126 out of about 14,000 cases (excluding 9 in which the paralysis came on as a temporary phenomenon immediately after the injection of salvarsan, as these, he thinks, are instances of Herxheimer's reaction). The great majority of cases came on in the secondary period. Only 5 of 118 cases occurred in the primary stages, 22 in combined and secondary lesions, and 82 during the frank secondary stage. The lesions, therefore, are most frequent when treatment is instituted in recent secondary syphilis. He thinks

they are more apt to follow hard chancres, or to coincide with persistent headache, or a papulo-pustular secondary rash indicating a severe form of infection. As regards the nerves involved, in the overwhelming number the second and eighth nerves are attacked, either alone or with other nerves, as is shown in the following table :—

	Total	Isolated	Combined
Nerve I	0	0	0
,, II	41	31	10
,, III	8	8	0
,, IV	2	2	0
,, V	0	0	0
,, VI	3	3	0
,, VII	10	9	1
,, VIII	62	51	11
,, IX–XII ..	0	0	0

The time after the injection when the nerve relapse occurs was as follows : Out of 115 early cases the symptoms commenced within one month of salvarsan treatment in 30 cases ; in the second month in 46 cases ; in the third month in 27 cases ; and in the fourth month in 8 cases.

Géronne and Gutmann[77] report several such cases. Their explanation is that with mercurial treatment the spirochætes were less perfectly killed, and therefore early recurrence of cutaneous manifestations leads to renewal of treatment which protects nerves. They agree in the main with Ehrlich in his contention that these nerve involvements are neuro-relapses, but they cannot exclude the possibility that (1) salvarsan has some deleterious action on the nerves which may render them more susceptible to syphilis ; or (2) That salvarsan changes the nature of the spirochætes. On these grounds they advise the treatment of these neuro-relapses with mercury.

Finger maintains that salvarsan has a directly damaging action on nervous tissue. He reports three cases of nerve relapse, none of which cleared up rapidly, in spite of renewed salvarsan or antisyphilitic treatment. Arsenic persisted in the urine for months, apparently being absorbed slowly from some depôt. Subsequently Mucha,[78] utilizing the cases treated in Finger's clinic, was able to report 44 cases of neuro-relapse involving practically every nerve in all conceivable combinations, out of a total of 500 cases treated. As a rule the nerves became involved six to eight weeks after the use of salvarsan. From the frequency with which meningeal symptoms were noted, and the fact that frequently several nerves were implicated, he does not agree with Ehrlich that these relapses can arise from isolated surviving spirochætes in the various nerves. He thinks them more likely the result of a cause acting on the base of the brain (in one fatal case such changes were actually present), perhaps as the result of a syphilitic

endarteritis. He accepts Ehrlich's view of relapsing syphilis for those cases which clear up on antisyphilitic remedies, but finds a large proportion do not improve, and in these the toxic action of arsenic cannot be excluded. Thus in a series of 18 cases of involvement of the nerves of the ear, five were transitory in their character and probably depended on a local Herxheimer reaction. In the other 13 cases the syphilis had been acquired within six months, and the ear trouble came on from five to twelve weeks after salvarsan administration. In five cases the trouble cleared up spontaneously; in three a complete and in two a partial cure was obtained with antisyphilitic treatment, while the remaining five proved refractory.

The case reported by Westphal[79] is interesting. In a woman suffering from a combination of syphilitic and tabetic disease of the spinal cord, the intramuscular injection of 0·4 and 0·2 gram into the right and left gluteal muscles was followed in seven hours by a fatal paralysis of the phrenic nerves. The post-mortem examination revealed a fresh syphilitic meningitis in addition to the chronic disease of the posterior tracts. In the thickened pia mater there was an infiltration of round cells, which in parts were aggregated together. These masses were found in the neighbourhood of the veins, and in several instances involved their walls without encroaching on the lumen of the vessels. The roots of the phrenic nerves were very degenerated. Westphal thinks that any swelling or hyperæmia of the cord as the result of the salvarsan treatment would have so interfered with the damaged nerves as to explain this death.

The difficulty of differentiating the damage produced by the drug from the symptoms due to the specific infection is great. Thus Juliusberg and Oppenheim[80] record a case of a man who became infected at the very end of 1910. He received as his first treatment an intravenous injection of 0·4 gram towards the end of March, before there was any secondary eruption. The injection failed to clear up the primary lesion, which still contained very numerous spirochætes. He received a second injection of salvarsan, and within a week developed spinal symptoms, spastic paraplegia, with bladder and bowel disturbance, and a marked girdle sensation. Though the case corresponded clinically to syphilitic meningomyelitis, the writers could not exclude possible damage by the drug. Certainly such well-marked spinal symptoms before the appearance of the secondary symptoms are unusual.

Congenital Syphilis.—The injection of salvarsan into infants suffering from hereditary syphilis is dangerous, as the destruction of the enormous number of spirochætes present in these cases leads to such a liberation of endotoxins that the little patients readily succumb. To overcome this danger Taege[81] and Duhot[82] suggested that the nursing mother might be treated with salvarsan, and the milk would then contain some of the antibodies elaborated in the maternal system. Jesionek[83] points out, however, that it is just as likely that the maternal endotoxin will be eliminated in the milk as the antibodies. In two cases

treated by him on this plan, the infants developed a peculiar erythematous rash, though previously neither had had any skin lesions. He thinks that in this way the children may receive a double dose of endotoxins, partly maternal and partly autogenous from destruction of spirochætes in the child's tissues. Taege's method has been extensively used, but is not without danger. Kalb[84] treated two children in this way, but both died from secondary infections. In one case the child had very extensive visceral changes and the prognosis was bad. The post-mortem examination showed that the spirochætes had been almost entirely killed off, as none could be demonstrated in the liver or suprarenal bodies. In the other case the prognosis was good, as the child seemed in good condition when the mother was injected. Post mortem, numerous spirochætes were found in the tissues. Marshalko's[85] results were also bad. Two infants died five and ten days after the mother was injected, and one infant improved. Escherich[86] found that this method of treatment did not prevent subsequent relapses. Freund[87] noted improvement in the child, whose serum reaction became negative in five weeks, though the mother's blood remained positive. Sequeira[88] saw a child improve though the mother's reaction was negative before the injection. [This suggests that the trace of arsenic in the milk may be sufficient to affect the child. Alston and Jesionek found that the milk of healthy goats after injections of salvarsan exerted a curative action when fed to children suffering from yaws and syphilis.]

The injection of the child has also been extensively used, but is dangerous. Döblin[89] had very bad results: of six children treated with injections of 0·03 gram, four died and the two survivors had relapses. In the organs no spirochætes were found post mortem. Hochsinger[90] had better results with his five cases. The result of injecting 15 mgrams per kilo body weight was in three cases good, in one useless, while the other improved but then relapsed. Nöggerath[91] also had a relapse four months after the treatment. Lesser's[92] results were good. He had no deaths in nine cases aged from five to ten weeks. The most exhaustive report is that of Bokay,[93] who treated twenty cases, of whom thirteen were under one year of age and the others ranged up to ten years. Three of the cases were acquired syphilis; the others were all hereditary. The treatment consisted in intragluteal injection, usually of a neutral Wechselmann suspension, which did not produce much pain. This treatment exerted a profound and rapid effect upon the disease. The specific lesions rapidly subsided, and in most cases the children gained in weight more rapidly than is the rule under mercurial treatment. Skin lesions faded very rapidly, and condylomata healed quickly within a week. Cracks about the mouth, lesions on the soles of the feet and palms of the hands, osteochondritis, pseudoparalysis, coryza, and paronychia all seemed to heal more rapidly than under mercurial treatment. The spleen diminishes, but remains palpable for some weeks. In nine out of the eighteen cases in which the Wassermann test was systematically carried out the reaction

became negative, and in many of the remaining cases it became less marked. That a negative Wassermann reaction does not indicate complete cure is shown by the fact that three children had relapses, though the reaction had previously become negative. The curative action in late hereditary manifestations seems less marked, especially in parenchymatous keratitis. Many observers note that after treatment was instituted the other eye became infected. Steindorff[91] states that 45 cases have been reported in which the opacity of the cornea improved and the visual acuity increased, but against this he found 75 recorded cases in which no improvement was obtained. He concludes that the effects of salvarsan treatment are no more marked than with other methods.

Wassermann Reaction.—In parasyphilitic diseases it seems very difficult to make the serum reaction negative. This applies both to the reaction of the blood and cerebrospinal fluids. The reaction of Nonne is also but little affected. On the other hand, pleocytosis of the cerebrospinal fluid seems in many cases to be reduced by systematic treatment with salvarsan. Spiethoff, in two cases of locomotor ataxia, noted diminution in the pleocytosis and Nonne reaction. Treupel,[95] in only one out of twenty-six cases of locomotor ataxia, obtained a negative Wassermann reaction in the blood and cerebrospinal fluid, and subsequently the cerebrospinal fluid again became slightly positive. Assmann[96] obtained no distinct diminution in the reactions, except as regards the pleocytosis, in six cases of tabes. His results in eight cases of early general paresis were similar. Hoffmann and Jaffé[97] state that in chronic cases of inveterate syphilis salvarsan is inferior to mercury in producing a negative Wassermann reaction.

In recent cases of syphilis it is apparently comparatively easy to convert a positive reaction into a negative, but in many instances when the serum reaction is followed, it again becomes positive. Numerous cases have been reported where relapses have occurred despite a negative Wassermann reaction (Mucha[98]). Géronne[99] with a single, usually intravenous, injection obtained a negative reaction in 57 out of 124 cases of secondary and tertiary syphilis, while in 25 out of 32 cases showing no clinical symptoms, on repeating the injection the positive reaction became negative. Gutmann[100] used three injections, and obtained even better results, as out of his 27 cases only two remained positive, and these were chronic syphilitics of many years' standing. In 16 cases the reaction was negative after the second injection, and in the other nine it became so after the third injection. In 21 of the cases the change to negative was obtained within six weeks of the first injection.

Of 26 cases of primary syphilis treated by Mucha with subcutaneous injections, which were kept under observation for at least six months, in only six were no secondary symptoms observed, and two of these are not very hopeful cases, as in one the negative reaction has turned positive, and in the other the reaction was never negative. The other four cases have been permanently negative for ten, eleven, and eight

(2 cases) months. This does not contrast any too favourably with Scherber's[101] results obtained with chronic intermittent mercurial treatment. In 25 cases observed for over four years, 6 patients have remained entirely free from secondary symptoms and have permanently had a negative Wassermann reaction. Zeissl[102] records six cases, treated with a single injection in the last week of July and first week in August, 1910, remaining free from secondary symptoms with negative Wassermann reaction till March 20th, 1911.

Spiethoff,[103] using the combined intravenous and intramuscular depôt injections, followed by a third intravenous injection in the fourth week, claims to convert a positive reaction in florid primary and secondary cases into a negative reaction in from two to seven weeks. Gennerich[104] combines mild mercurial treatment with salvarsan injections, as he finds the two drugs more effective than salvarsan alone. If the syphilis has lasted longer than forty days, he advises a double injection of 0·5 gram intravenously, followed in two days by 0·6 gram intramuscularly. In very early cases, or where there has been recent mercurial treatment, a single intravenous injection of 0·5 gram is efficient. Lesser[105] advises smaller doses, and finds that with 0·1 gram weekly the reaction becomes negative as a rule in six weeks. Isaac makes a similar statement.

Conclusion.—From this record it is clear that salvarsan is a most potent remedy against syphilis, which by general consent is more rapid in its therapeutic action than our other antisyphilitic remedies. On the other hand, like all antisyphilitic remedies, it seldom produces a complete cure. Though the lesions heal rapidly, the disease is not eradicated, except in a very small proportion of the cases. Consequently, we must acknowledge that Ehrlich's hope of curing the disease by a single administration of the drug has proved fallacious. At the same time, we must recognize that salvarsan treatment has materially altered the clinical course of syphilis. Time alone will show whether this change entails subsequent danger to the patients. So far as we can at present judge, salvarsan has made nerve relapses more common, and has certainly made them occur more frequently in the early stages of the disease. It must be remembered, however, that during the past year an altogether unwonted clinical interest has been taken in syphilitic cases. The cases have been more closely observed, and every point of interest has been reported. The past year has materially added to our knowledge of the disease, notably as regards nerve relapses and the prognostic significance of a negative Wassermann reaction.

II.—Salvarsan in Other Diseases than Syphilis.

Bilharziasis.—Joannides[106] tested salvarsan in bilharzia infection, and states that 0·6 gram injected intramuscularly, according to Alt's method, exerts a marked curative action. The eggs disappear from the urine in a few days, and subsequent examination of the patient shows that the cure is lasting.

Chorea.—Several writers record cases in which salvarsan has proved of use in chorea. The drug has been given subcutaneously by Bokay[107] and Hainiss ;[108] the dose for children was 0·2 gram, and a cure was obtained in fifteen to twenty-eight days. Mayerhofer's[109] case of relapsing post-rheumatic chorea is interesting. The patient had had six relapses in three years. The last attack proved very intractable to treatment, and did not improve under oral administration of arsenic, though the drug was pushed to the production of well-marked melanosis. Two months later an injection of 0·25 gram salvarsan was of little benefit, but a second injection of 0·5 gram one month later cleared up the choreic manifestations within a week. Hahn[110] administered the drug intravenously with good results in chorea minor, obtaining cures in from eight to twenty-eight days. The dose for children of twelve years was 0·1 gram repeated twice at intervals of three to seven days. Each injection was followed by a great increase in the mental and muscular excitement, lasting for a few hours. In one of his cases a basal systolic murmur cleared up.

Frambœsia is so closely allied to syphilis that it was probable that salvarsan would prove of value. It has been tested by Rost,[111] Castellani,[112] Strong,[113] and Alston,[114] who agree that salvarsan exerts a rapid curative action. The cutaneous lesions begin to improve within twenty-four hours, and are healed within a week. The soft glandular swellings also decrease rapidly, but the nasal lesions are resistant, probably owing to secondary infection with other germs. Alston[115] made the interesting observation that the blister serum of patients cured with salvarsan is efficient when injected into others. He used the serum from cantharides blisters. Subsequently he discovered that after the administration of salvarsan to a healthy goat, its milk possessed specific action against frambœsia. He fed two children with the milk, and noted improvement in the symptoms from the third day. Nichols[116] demonstrated the curative action of salvarsan on yaws in rabbits and monkeys .

In *Leprosy* the drug has been tested by Isaac,[117] Fox,[118] Rumpel,[119] Montesanto,[120] Ehlers and Gioseffi,[121] but has been found to exert no distinct action, though several observers state that it produces granular degeneration of the bacilli. Montesanto finds that small doses have no action, but large doses produce a reaction somewhat similar to that noted in syphilis. This he thinks indicates some action. Though salvarsan does not check the further development of a leproma once it is formed, it seems to hasten the epitheliazation of the ulcerated patches.

Lymphadenoma and Malignant Growths.—Gulland[122] saw temporary improvement, with diminution in the size of the glandular masses, in an advanced case of severe lymphadenoma, after the use of salvarsan, and thinks the drug is well worth trying in the early stages of the disease. Czerny and Caan[123] do not believe that salvarsan has much action in lymphosarcoma or Hodgkin's disease, but in sarcoma the action was more satisfactory. In cancer, though no direct influence upon the size of the tumour can be detected, subjective relief of pain

was often seen. On the other hand, Rumpel[119] states that he obtained no benefit in six cases of sarcoma. Kopp[124] states that in a case of sarcoma the injection of salvarsan was on two occasions followed by a marked diminution and softening of the tumour, with relief of the local pain and disturbance.

Malaria.—In the treatment of tertian malaria, salvarsan seems of value. Rumpel[119] saw the parasites disappear from the blood in five cases of tertian fever within forty hours, but they reappeared in three of the cases in from twelve to twenty-three days. He obtained no effect in tropical malaria. Iversen and Tuschinski[125] used salvarsan in 61 cases, and had similar results. A single intravenous dose of 0·5 gram causes the tertian parasites to disappear from the peripheral blood in from twelve to forty-eight hours. In quartan fever the action is less marked and relapses occur. In tropical malaria the ring forms can be removed temporarily, but the crescents are not affected. In some cases the drug seems to do harm, as after a temporary improvement both rings and crescents appear in increased numbers.

Pellagra.—The collective report of Cole and Winthrop[126] includes 21 cases of pellagra treated with salvarsan by American physicians. The results obtained were evidently no better than with other methods of treatment, but in about 33·3 per cent of the cases improvement, lasting seven or more days, was seen. Rice, McLester, and Torrance[127] report three cases in which the intravenous administration of small doses of 0·05 gram salvarsan was followed by rapid improvement in regard to weight, diarrhœa, cutaneous manifestations, and mental state.

Plague.—Schreyer[128] used salvarsan in a few cases of pneumonic plague. He thinks that it has some action, as the temperature falls to normal, and one of his patients was able to walk about within twenty-four hours. Unfortunately it has no effect in preventing secondary heart failure, to which all his patients succumbed.

Pernicious Anæmia.—Bramwell[129] has reported two cases in which rapid improvement was obtained, but against this we have the experience of Leede,[130] who found that in five very severe cases salvarsan invariably proved ineffectual. He considers salvarsan directly contraindicated in this disease. On the other hand, it proved very successful in a severe syphilitic anæmia.

Scurvy.—According to Gerber,[131] the gum lesions in scurvy depend upon local infection with a spirochæte and a fusiform bacillus. Under treatment with salvarsan rapid cure was obtained.

Septicæmia.—Lucksch[132] has investigated the action of salvarsan in this condition. Experiments showed that in dilutions of $\frac{1}{2}$ to 2 per cent it kills or delays the growth of certain organisms, notably staphylococci and streptococci. It was unreliable against pneumococci. Experiments on animals inoculated intraperitoneally with living cocci confirmed these findings, and in a small number of cases of staphylococcal or streptococcal septicæmia in human beings a favourable influence was claimed. Rumpel[119] found salvarsan useless in one case each of streptococcæmia and staphylococcæmia, and in three cases of scarlet fever.

Tuberculosis. — After injection of salvarsan, Herxheimer and Altmann[133] have noted a local reaction in the tuberculous lesions of syphilitic patients, followed in some cases by breaking down. Subsequently, they studied this phenomenon in cases of lupus, and found that within a few hours salvarsan produced swelling, redness, and discomfort in the patches. This passes off within twenty-four hours, and no therapeutic result is obtained. They hold that this local reaction arises from a deleterious action of salvarsan upon the outer layer of cells in the tubercles, which permits the tuberculin contained in the inner layers to pass the protecting layer of sound cells and penetrate into the surrounding tissues, which are hypersensitive to tuberculin and therefore react. Zieler[134] noted hæmoptysis twice after injections of salvarsan into a man suffering from phthisis.

Vaccinia.—Marks[135] tested the action of salvarsan on the development of the cutaneous manifestations which follow the intravenous administration of calf lymph in rabbits. The simultaneous administration of 0·1 or 0·08 gram salvarsan per kilo body weight entirely prevents the cutaneous manifestations, but smaller doses than these have no action. Further, if these doses are administered twenty hours after the injection of vaccine they exert no inhibiting action, and the same holds true even if they are repeated.

Variola.—Haller[136] used salvarsan in four cases of small-pox. In early cases it seems to influence materially the cause of the disease. In one very early case the disease was aborted. The papules began to disappear by the next day, and within four days the skin was quite free from eruption. In the other cases the temperature fell, and the eruption ceased to spread. He therefore advises the use of salvarsan in the early stages of the disease, while the germs are presumably still in the blood. Once the disease is localized in the skin it is more difficult for the salvarsan to reach them.

Vincent's Angina.—Gerber[137] investigated the effect of salvarsan upon the spirochætes and spirilla found normally in the mouth, teeth, and tonsillar crypts. He found that intravenous injections of salvarsan had no influence upon these forms, which are normal inhabitants of the mouth ; but in Vincent's angina, a mixed infection with a spirochæte and a fusiform bacillus, salvarsan exerts a curative action. This confirms the experience of Rumpel,[119] who used salvarsan successfully in seven cases of Plant-Vincent angina.

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SANTONIN.

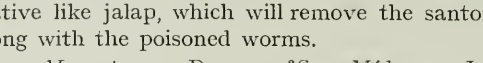
Baxter[1] records a case in which the administration of a ½ gr. of santonin dissolved in 2 dr. of castor oil was followed by complete loss of vision. In a note on this case, Mayor[2] points out that probably the increased toxicity of santonin in this case arose from the fact that it was given in an oily solution. It is known that it is dangerous to administer castor oil along with or after filix mas, and probably the same thing holds good for santonin. To exert its vermicidal action it is unnecessary for the santonin to be absorbed from the intestinal canal. The soluble salts of santonin are almost without effect as vermicides, since they are absorbed and prove highly toxic. To ensure

the proper local action on the intestine, it is best to administer santonin in an insoluble form as a powder, and follow it up with some sharp purgative like jalap, which will remove the santonin from the intestine along with the poisoned worms.

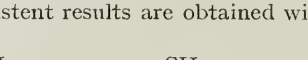
References.—[1]*Lancet*, 1910, Dec. 10; [2]*Sem. Méd.* 1911, Jan. 25.

SCARLET RED.

Of the various scarlet-red dyes on the market, Davis[1] finds that the best and most consistent results are obtained with toluene-azotoluene-azo-β-naphthol



The β-naphthol component is markedly irritating to the skin, but the other component, amido-azotoluol



gives an even more marked stimulating effect on the growth of epithelium than scarlet red. During the past year Davis has used scarlet red or amido-azotoluol in a number of cases with almost uniform success. He finds marked epithelial stimulation even when the wounds are unhealthy and discharging profusely, though the most rapid results are obtained with flat healthy granulating surfaces. It is safe to use a 4 per cent scarlet-red ointment on partial **Skin Grafts** of all kinds forty-eight hours after grafting, and there is rapid stimulation of the wound edges and of the grafts. He reports a case which shows that even old age and great debility seem to have little deterrent effect on the stimulating power of scarlet red. He has obtained excellent supple scars with the ointments, and no healed surface has ever broken down again. For some time the healed skin is inclined to be unduly scaly, but the use of a lubricant meets all requirements. There seems to be no danger of producing malignant growths by the clinical use of the ointments. As a rule, there are no toxic symptoms after the use of the ointments; but Gurbski[2] reports the case of a girl, aged 11 years, on whom the application of an 8 per cent amido-azotoluol ointment to an extensive burn was followed in fifteen hours by headache, dizziness, vomiting, and gastric pain. The pulse became rapid and of low tension, while the temperature rose. There was cyanosis of the legs, and the urine contained albumin. On removing the dressing the toxic symptoms passed off in a few hours, but reappeared promptly on two further occasions when the ointment was used again.

References.—[1]*Ann Surg.* 1911, 702; [2]*Cent. f. Chir.* 1910, 1550.

SENNA.

Stierlin[1] confirms the statement of Magnus that senna acts only upon the large intestine. By means of radiographic observations on human beings who had swallowed bismuth paste, he was able to show that the administration of senna produced practically no hastening of the

passage of the bismuth along the intestinal canal till it reached the large intestine. Carnot[2] has confirmed this by direct observation on isolated loops of the small intestine. He finds that senna causes no increase of secretion or of peristalsis in the small intestine.

REFERENCES.—[1]*Münch. med. Woch.* 1910, July 5 ; [2]*Paris Méd.* 1910, Dec. 3.

SILVER ATOXYL.

This preparation is the mono-silver salt of p-amido-phenylarsenic acid, and corresponds to atoxyl, the sodium salt of p-amido-phenyl-arsenic acid. It contains 33 per cent of silver and 23 per cent of arsenic, and was prepared by Blumenthal[1] in order to combine the germicidal properties of silver and atoxyl. He states that it is not more toxic than atoxyl, and he has obtained good results with subcutaneous injections in **Gonorrhœal Arthritis.**[2] Hirsch[3] found it useful in **Septic Conditions.** Eisenberg[4] also reports a case of very severe sepsis with daily rigors and metastatic pneumonia, in which the drug saved the patient's life after her condition seemed desperate. The septic condition had lasted for forty-two days, and though rectal injections of collargol, subcutaneous injections of electrargol, and saline infusions had all been tried, no improvement was obtained till silver atoxyl was used. The drug was given suspended in olive oil, and was injected into the muscle of the upper part of the thigh. The result was immediate reduction of the fever and cessation of the rigors. The dose used was 5 gr., and this was repeated on the second and the fifth day. Apart from a slight shivering on the fifth day before the last injection, the rigors ceased entirely, the temperature fell to nearly normal, and the patient began to pick up her strength rapidly and developed an enormous appetite. The injections produced local infiltrations, one of which suppurated and had to be opened.

REFERENCES.—[1]*Biochem. Zeits.* 1910, 91 ; [2]*Deut. med. Woch.* 1910, Nov. ; [3]*Med. Klinik.* 1911, No. 28 ; [4]*Berl. klin. Woch.* 1911, 1643.

THALLIUM.

Thallium salts are seldom used except in France, where at one time they had a vogue as a means of checking excessive sweating. As a peculiar sequela of such treatment, it was noted that not infrequently a temporary generalized alopecia resulted. Buschke[1] has investigated this action on animals, and finds that minute doses of thallium salts cause alopecia. In the case of mice and rabbits the distribution is peculiar, affecting the back of the head and body ; but with rats universal baldness is produced, and in some cases the young of such animals are born in the same condition, which, however, gradually passes off. In addition to the effect on the hair, thallium produces apathy, loss of appetite, and weakness. Apparently these symptoms are central in origin ; and as the skin shows no changes, Buschke holds that the baldness is also due to a central nervous cause. Its anti-hydrotic effect is not due to a peripheral action. In France, thallium salts have been found of value in the treatment of experimental syphilis in animals ; but Buschke was unable to confirm this statement.

REFERENCE.—[1]*Deut. med. Woch.* 1911, Jan. 26.

TROCHISCI.

Sawyer[1] recommends as a new basis for trochisci, ordinary chocolate cream. The " cream " is made by evaporating a mixture of milk and sugar. This can readily be medicated by adding such substances as menthol, volatile oils, borax, sulphate of zinc, etc., and then filling into the ordinary chocolate shell. For rapid extemporaneous production an ordinary chocolate cream can be medicated by injecting with a hypodermic needle a drop of the medicine in a liquid form.

Reference.—[1]*Lancet*, 1911, i, 436.

TUBERCULIN.

In a critical review of the use of tuberculin in the treatment of so-called **Tuberculous Glands,** Waugh[1] discusses the difficulties of the problem. All enlarged glands are not tuberculous. Clinical signs may indicate chronic enlargements, but give no real evidence that the enlargement is due to tubercle. Examination of glands, after removal, often fails to reveal tubercle, but demonstrates other infective agents. Skin tests, e.g., Von Pirquet's, do not sufficiently connect the reaction with the suspected tissue. A positive reaction may be due to tubercle elsewhere than in the suspected glands, and even in undoubtedly tuberculous persons the reaction may be negative. Most writers, recognizing the importance of constant reinfection in keeping up chronic enlargements of glands, remedy such obvious sources as bad teeth, diseased tonsils, running ears, etc., but fail to differentiate between this treatment and the tuberculin, using both simultaneously. Again, the local treatment of the infective source may be inadequate, e.g., the use of the guillotine instead of enucleation for enlarged tonsils. Lastly, as we cannot always recognize clinically small necrosed areas in the interior of enlarged glands, and tuberculin obviously cannot bring about their removal, its value may be unduly discounted. Recognizing these fallacies, Waugh attempted to determine the value of Wright's bacillary emulsion by investigating 191 cases treated at the Children's Hospital, Great Ormond Street. In 181 cases, all had the source of reinfection stamped out, and while in the first 130 cases no tuberculin was administered, in the remaining 50 tuberculin injections were also used. In the treatment of the primary foci of infection all the cases had their tonsils dissected out ; and 60 per cent were also treated by the extraction or stopping of carious teeth. While the cures without tuberculin were obtained in from four to six months after removing the primary foci of infection, those treated with tuberculin recovered on an average in about seven months after dealing with the foci. He concluded that the most important factor is the complete removal of the primary foci of infection. The value of the bacillary emulsion as an additional means of treatment has yet to be proved, though it seems to be harmless. In cases where the glands removed proved to be tuberculous, thickening of the operation scar frequently occurred and, as a rule, disappeared under a course of tuberculin injections.

Tuberculin Endotin.—Koch's original tuberculin consisted of a

glycerin extract of tubercle bacilli. It was recognized by Koch that in the preparation there were present not only the specific active principles of the bacilli, but also various other bodies (proto-, hetero-, deutero-albumoses) which were looked upon as inert indifferent substances. More accurate investigation has, however, shown that these albumoses are by no means so innocuous as was at first thought. After administering tuberculin we may observe a local reaction in the foci of disease, and a more general reaction on the part of the body. The local changes in the diseased tissue are held to be the real specific effect of the tuberculin, while the general reaction (fever, malaise, pains in the limbs, etc.) are now usually looked upon as the result of the introduction of the albumoses. Many attempts have been made to produce a purified tuberculin which, while retaining the specific tuberculin effect, will be free from the toxic albumoses. A form which has been used in Russia and Bulgaria is prepared by Gabrilowitsch's method. By treating the original tuberculin of Koch with xylol, ether, chloroform, and alcohol, he claims to produce a pure specific substance free from admixture of other bodies. Under the name endotin this substance is supplied to the profession. The reports about endotin are chiefly contained in Russian papers, but the drug seems now to be on its trial in Germany, and those who have used it are beginning to communicate their results to the medical journals. Gordon[2] has employed it in a series of **advanced cases of Tubercle,** and relates that he has obtained excellent results. His patients were not treated in hospital, and the few detailed cases which he records show that the preparation acted well in advanced forms of the disease, even under very poor hygienic conditions. He claims that endotin causes no febrile reaction or general disturbance, and therefore can be used: (1) Even by those patients who are very susceptible to the old form of tuberculin; (2) By patients who are highly fevered; (3) In advanced cases when the patients are far through. Koch[3] used endotin in his sanatorium practice, and tested it on twenty-five cases. He is fairly well satisfied with his results, and thinks the preparation is worthy of more extensive clinical trial. He notes that it causes almost no general disturbance, or fever, and that it can thus be used for the treatment of ambulant patients. It raises the body weight, but does not seem to reduce fever. It does not produce local infiltrations at the site of injection.

References.—[1]*Quart. Jour. Med.* 1911, 521; [2]*Deut. med. Woch.* 1910, Sept. 22; [3]*Münch. med. Woch.* 1910, Dec. 27.

UROTROPIN.—(*See* Hexamethylene-tetramine.)

UZARA.

This is the name given to the root of a variety of asclepiadaceæ, which is found in certain coast districts of equatorial Africa. It is used by the native medicine men as an antidiarrhœic. Bachem[1] has investigated the pharmacological action of a weak alcoholic extract of the drug. It possesses very slight toxicity when administered by the mouth, and possesses distinct astringent properties when tested in

Diarrhœa of cats, rabbits, and dogs. The action was promptly produced in a few hours, and was not followed by after-constipation. The drug seems to contain a number of active bodies, which act upon the nervous circulatory systems when administered by subcutaneous or intravenous injections. One of the active principles when introduced as a small dose intravenously causes an enormous increase in blood-pressure resembling that brought about by adrenalin. In large doses the heart is paralyzed.

Reference.—*Berl. klin. Woch.* 1911, 1515.

VACCINES.

Gonorrhœa.—Friedlander[1] finds vaccine treatment very effective in epididymitis and acute and subacute gonorrhœa, and satisfactory in acute and subacute follicular prostatitis, where it at least shortens the duration of the disease and assists other therapeutic measures. It fails, however, in the dregs of epididymitis resulting from cicatricial tissue, and in acute and chronic infection of the urethra and bladder, in which conditions it cannot compete with the silver preparations.

Mastitis.—Benians[2] holds that vaccines are of use in acute and chronic cases of mastitis. Bacteriologically he finds that the infecting organism is usually either *Staphylococcus aureus* or a *Streptococcus*, especially the former. It enters by the ducts, causing clotting of the milk and obstruction, and multiplying in the acini. Clinically the condition appears as a lobular mastitis (usually developing on nursing being stopped), and subsequently the surrounding tissues may be involved in suppuration. The streptococcal form of infection is less common. It results from a lesion of the nipple, and the infection, advancing by the lymphatics, at first produces inflammation of the interglandular cellular tissues. This form of mastitis is easily remedied by vaccine treatment. The organisms lie in the lymphatic vessels and connective tissues of a part well flushed with body fluid ; hence any increase in the opsonin content of the blood- and lymph-streams is readily brought into effective action on the diseased part. These streptococcal forms of mastitis are thus favourably influenced by judicious vaccine treatment, and in some cases suppuration may be prevented altogether. In the staphylococcic type of mastitis the conditions are less favourable. The cocci lie inside the acini and ducts, practically outside of the range of the body fluids. The opsonin content of milk is low, though it varies proportionately with that of the blood-stream. Hence Benian's attempts to abort the threatened suppuration by large doses of vaccine have not been very successful. He holds that in any case the resistance of the body to the infecting organism should be raised as much as possible in case suppuration should occur. Thus suppuration is kept within very small limits, and healing is rapid when the pus is evacuated. He insists that pus should be let out as soon as detected, and adequate drainage provided. Immediately after operation he gives an injection into the upper arm of 400 to 800 million of a stock vaccine of *Staphylococcus aureus*, and in most

cases a cure is obtained with a second similar injection one week later. The surgical drainage provided must be free ; otherwise, when the pus becomes pocketed vaccines only aggravate the condition. In cases of chronic suppurating sinuses following acute mammary abscess, vaccine treatment is useful, but owing to the presence of so much scar tissue, which interferes with local blood and lymph supply, it is necessary to use local treatment with gauze drains soaked in hypertonic citrated salt solution, and to persevere with the vaccines for some weeks. In thirteen cases where suppuration had been going on for an average of fourteen weeks, a cure was obtained in the average time of five and a half weeks after instituting vaccine treatment.

Schäfer's Modified Vaccines.— A modified vaccine treatment is described by Schäfer,[3] based upon observations which show that the growth of invading micro-organisms can be arrested, and their pathological effects neutralized, by the use of products derived from their development in artificial culture media. The solutions used are neither ordinary sera nor vaccines, but solutions in sterile water of the soluble substances produced by the organisms growing in suitable culture media. The solution is freed from bacteria by filtration through porcelain, and is sterilized by the addition of 0·5 per cent phenol. The mixed-infection vaccine is made from a large variety of pathogenic growths—*staphylococci, streptococci, pneumococci, B. pyocyaneus, B. typhosus, B. coli, B. dysenteriæ,* etc., grown in separate flasks for forty-eight hours, after which phenol is added with sufficient sterile water, and the whole filtered through a Chamberland filter. When the causative agent of a disease is known, e.g., in gonorrhœa, this basic mixed-infection vaccine is modified by the addition of an excess of the products of the specific organism. Otherwise, in infections of unknown cause, the mixed-infection vaccine is used. The usual dose of the vaccine is 10 c.c. given either subcutaneously or intravenously. The former application is painful, and there is a local reaction lasting three or four days. The intravenous injection is followed by a typical reaction in ten to thirty minutes, with chill, rise of temperature, and rapid pulse. Children can take relatively larger doses than adults. As a rule repeated injections at twenty-four to forty-eight hours' interval, are needed in acute infections. The intravenous injection should be done very slowly, with the patient lying down, taking at least three minutes to inject 10 c.c. Too rapid injection produce dizziness, flushed face, pain in the stomach and small of the back, with nausea and vomiting. If the patient complains of dizziness, the intravenous injection should be stopped, and the rest of the dose given hypodermically. Apart from terminal infections there are no contraindications. Practically all infected surgical cases can be treated with the mixed-infection vaccine. In **Pneumonia,** with the special pneumococcus vaccine, the results seem good. Fifty-six cases of lobar pneumonia were treated without a death. The injection is followed in from ten to thirty minutes by a severe chill, the temperature rises for a short time, and within three hours in successful cases the

patient breaks into a profuse perspiration ; inside of eight hours the temperature falls to normal, and then tends to rise again unless the injection is repeated. Schäfer advises injection every twenty-four hours till at least four have been given. In **Typhoid Fever** the results seem equally astounding. Usually 10 c.c. of a special typhoid vaccine was given intravenously, and in relapsed cases was repeated every day for six doses. Without any other treatment except diet, of 150 cases so injected, only four died, the average recovery time being ten days from the administration of the first dose. Schäfer considers that he is justified in believing that all cases of typhoid fever treated in the first week, and many during the second week, may be cured within three days, the beneficial effects being seen within twenty-four hours.

References.—[1]*Med. Press*, 1911, Feb. 1 ; [2]*Brit. Med. Jour.* 1911, Ap. 15 ; [3]*Ther. Gaz.* 1910, 257.

YASOTONIN.

Yohimbin, in addition to its stimulating effect upon the respiratory and sacral centres, causes dilatation of blood-vessels. Müller and Fellner[1] claim that yohimbin forms with urethane a new substance, vasotonin, which retains the vasodilating effect of yohimbin while the stimulating effect upon the respiratory centre is lost. (Sprigel[2] thinks that vasotonin is a mixture, not a definite compound.) Experiments on animals show that vasotonin does not affect the heart, but produces a distinct fall in blood-pressure by a peripheral vasodilatation, which is manifested in a distinct increase in the bulk of the extremities, as can be shown in plethysmographic experiments. The vasodilating action is not obtained with oral administration, but is seen after hypodermic injections. In clinical experiments they claim that the drug produces a more lasting fall of blood-pressure than the nitrites, and at the same time the unpleasant effects of the latter substances are absent. They have used it successfully in **Angina,** and in **Cardiac and Bronchial Asthma**. Stachelin[3] finds it useful in angina pectoris, in **Arteriosclerosis,** and **High Blood-Pressure.** He advises the use of a small dose, which may be increased if well borne. As a rule, two or three injections weekly are required, and for a lasting effect a course of ten injections at least is necessary.

Schattenstein[4] has recently investigated its action in a small series of twelve cases. Among these were examples of anginous attacks arising from high arterial tension, arteriosclerosis, aortic valvular disease, and aneurysms of the aorta. In all these types of cases a course of fifteen injections of vasotonin, either every day or every second day, caused a reduction in the blood-pressure, which in several cases lasted for a long period after the drug was stopped. In five of the twelve cases the drug did not give such good results as were obtained with nitroglycerin ; but, on the other hand, in three out of the seven cases where vasotonin acted well, nitroglycerin had proved useless. In most of the cases vasotonin gave marked relief of the anginous symptoms.

References.—[1]*Ther. Monats.* 1910, June ; [2]*Ibid.* 1910, July ; [3]*Ibid.* 1910, Hft. 9 and 10 ; [4]*Deut. med. Woch.* 1911, Ap. 13.

VERONAL.

Max Meyer[1] has used veronal in minute doses with excellent results in **Gastro-intestinal** derangements associated with **Neurasthenia.** The dose used is from $\frac{1}{10}$ to $\frac{1}{2}$ gr. along with ordinary stomachics and tonics.

REFERENCE.—[1]*Prescriber*, 1911, Mar.

WATER.

McCrae[1] advises the drinking of large quantities of water, with the object of increasing the excretion of toxins, in such infectious conditions as **Pneumonia** and **Typhoid Fever.** Internal hydrotherapy is also indicated in the chronic forms of **Arthritis** and **Functional Nervous Disturbances** which seem to depend upon a toxic origin. He points out that in acute diseases the patient must be encouraged to drink water. In typhoid fever the effort should be made to have the patients pass at least 3000 c.c. and, better, 5000 c.c. of urine. In pneumonia such amounts can hardly be reached, and perhaps 2000 c.c. is as much as can be hoped for. In **Septicæmia** the larger amounts should be aimed at. When giving diuretic drugs, if a copious excretion of urine is desired it is necessary to remember to give water freely.

Gore[2] assumes as a working hypothesis that such diseases as **Gout, Rheumatism, Rheumatoid Arthritis, Colitis,** the various forms of **Neuritis, Glycosuria, Arteriosclerosis, Dyspepsias,** and most **Skin Diseases** have a toxic basis, probably intestinal in origin. Such cases are often benefited by a resort to a spa. As an explanation of the benefit obtained, he suggests that the drinking of copious supplies of mineral water on an empty stomach acts as a gastro-intestinal douche, whereby the upper intestinal tract is mechanically swept free of germs, and their growth rendered more difficult; and that the catarrhal mucous membrane is restored to a healthy condition, while in the lower bowel the secretions are increased and purgation induced. At the same time the fluid absorbed stimulates diuresis, and so facilitates the removal of any toxins absorbed.

REFERENCES.—[1]*Jour. Amer. Med. Assoc.* 1911, 1639; [2]*Brit. Med. Jour.* 1911, June 3.

RADIO-ACTIVITY IN DIAGNOSIS AND TREATMENT.

BY

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During the past year, without any distinctly new advance or application, the general technique of *x*-ray work has improved in nearly all directions ; and the use of *x*-rays, more especially in diagnostic work, has been considerably extended in various conditions. The discussion on radium therapeutics at the British Medical Association meeting at Birmingham was especially instructive. The Berlin Röntgen Congress in April, 1911, lasted two days instead of only one as formerly ; a large number of the papers read were observations by different workers on stomach work, and Haenisch and Groedel both discussed the progress in Röntgen Cinematography, and showed radiographs demonstrating stomach movements. During the year it was decided to have a section of Radiology at the London International Congress of Medicine, 1913. The year's work has been noticeable for the many valuable papers published by British workers, and with this advance in the quality and reliability of the work is associated an increasing confidence in, and dependence upon, the results of *x*-ray observations in Medicine and Surgery generally.

X-RAY DIAGNOSIS.

Gastro-Intestinal Conditions.—There are two important papers by Jordan on **Duodenal Obstruction**[1] and **Ileal Kinks,**[2] and further references to the value of *x*-rays in these conditions are in papers by Lane[3] and Chapple.[4] Jordan gives 4 ounces of thick emulsion of bismuth carbonate in duodenal cases, and watches the condition with the patient lying down for some hours at intervals of 15 minutes. It is of importance that the patient should sit or stand up between the different examinations. Duodenal obstruction (*Plate I, Fig. A*) is frequently associated with obstruction at the lower end of the ileum, or in the large intestine ; many of the cases exhibit also dropping of the stomach and large bowel. In the paper on ileal kinks (*Plate I, Fig. B*), Jordan suggests increasing the bismuth to 5 or 6 ounces, as giving a better opportunity for detecting slight abnormalities in this region. He has given this dose in more than 100 cases without any ill effect. The meal should be timed so as to enable the observations to be made for the 6 to 12 hours after it is taken. In many of the cases the ileum ends in a long coil which rises out of the pelvis upwards and to the right with the patient lying down.

PLATE I.

SKIAGRAMS BY DR. A. C. JORDAN ILLUSTRATING THE USE OF BISMUTH IN ABDOMINAL DIAGNOSIS

Fig. A. – Duodenum, in a girl, 19, showing the powerful contractions by which it sought (in vain) to overcome the effect of kinking at the duodeno-jejunal junction. (Confirmed by operation). The duodenum appeared to be writhing. (*a*, *b*, *c*), Duodenum. (Cr.) Crest of ilium. (U) Umbilicus.

Fig. B.—Ileal kink, in a man, 71. Taken 24 hours after a bismuth meal. Showing a long terminal coil of the ileum, hitched up for the upper 3 inches, and obstructed in the last inch. (Confirmed by operation, and the patient cured). (U) Umbilicus.

The degree of fixation can be seen on the screen with considerable accuracy by making deep pressure with the hand (wearing protection gloves) or with a wooden spoon. Reginald Morton[5] discusses the examination of the whole digestive system, and advocates the upright position of the patient in all cases. He urges strongly that every patient complaining of dysphagia should be examined at once by the *x*-rays. In the examination of the stomach, it is necessary to remember that there are few normal adult stomachs, and also that no particular size and shape can be said to be normal more than several others: the J-shaped is probably more frequently observed than any other. Barclay[6] explains some of the difficulties in diagnosis in stomach work. He is of opinion that the J-shape is the usual normal appearance, and sums up his conclusions by saying "that, provided a good screen view can be obtained, a definite opinion can be expressed as to the actual state of the stomach as it fulfils its functions, and a definite opinion as to the presence or absence of pyloric obstruction and hour-glass stomach can be formed."

Speaking from a large experience in the Röntgen diagnosis of **Carcinoma of the Stomach,** Pfahler[7] states that we have in this method the most positive means yet devised for the recognition of carcinoma in any stage of the disease. The value of the method depends upon the fact that carcinoma modifies the outline, position, or lumen of the alimentary canal, or interferes with its peristaltic motility, or obstructs the passage of food. The earliest sign is interference with the peristaltic waves.

Chronic Gastric Ulcer is discussed by Adler[8] and by Handek.[9] The former gives 1½ dr. of bismuth carbonate in half a glass of water on an empty stomach, and takes radiographs in from 4 to 6 hours afterwards. This allows time for all the bismuth to disappear from the stomach and duodenum, except such as may be deposited in the crater of an ulcer. On the other hand, Handek states that in the ordinary flat ulcer, the supposition that the bismuth would form a layer on the ulcerating surface, and thus show a picture of the ulcer itself, has been totally disproved by experience, but that any abnormal circumscribed shadow which is seen after a bismuth meal is due to the enclosure of the bismuth in a pathological pocket or diverticulum.

Hour-glass Contraction is considered in an article by Rowlands.[10] Care must be taken not to confuse a true constriction with the appearances sometimes seen in a dilated, dropped, stomach. Hour-glass contraction may be overlooked when the stricture is very tight, unless the screen examinations are repeated several hours after the bismuth meal is taken. The bismuth and *x*-ray test, if carefully applied, is reliable, and is the best clinical method of finding out if there is, or is not, an hour-glass condition. Holland[11] publishes a series of radiographs in a typical case showing the appearances in four stages: (1) immediately after, (2) a quarter of an hour after, (3) an hour after, and (4) three hours after the test meal. Cole and Einhorn[12] have injected air into the stomach and colon for the purposes of *x*-ray

examination, and claim advantages over the bismuth method in certain cases of disease affecting these organs.

The diagnosis of *adhesions of the pyloric end of the stomach and the duodenum to the gall-bladder region* can be made according to Pfahler,[13] and can be differentiated in many cases from adhesions due to malignant disease. Examined in the upright position on the screen, these cases show that instead of the bismuth food dropping quickly to the lower pole of the stomach, as it does normally, it is carried more slowly to the right of the median line and distinctly above the umbilicus. The condition must then be studied whilst making various degrees of pressure and observing the amount of motility, etc. With regard to the differential diagnosis between simple and malignant adhesions, in the latter cases as a rule there is in addition more or less characteristic encroachment on the lumen of the stomach. Plates should be taken of all cases in addition to a screen examination.

Renal Diseases.—It is possible now, even with a coil and mercury break, to obtain good radiographs of the kidney areas, in many cases with exposures of from $\frac{1}{2}$ to 1 second (Holland[14]), and with an intensifying screen the exposure can be made in that fraction of a second in which it is possible to jerk on and off the main current switch. Working with a modern type 15 in. coil and a break of the Sanax type, no kidney exposure, however large and fat the abdomen is, need be of longer duration than about 5 seconds. Immelmann[15] of Berlin, at the Berlin Congress in April, 1911, reported upon his results in 2,800 radiographs of the kidneys and ureters, in which he found 466 cases of **Calculus;** there was failure of diagnosis in 3 per cent of the positive, and in 1 per cent of the negative, diagnoses. Thurstan Holland[16] reports a case in which three stones in an adult kidney weighed respectively $1\frac{1}{2}$ gr., $\frac{1}{2}$ gr., and between $\frac{1}{5}$ and $\frac{1}{6}$ gr.; they were all shown on various plates, and afterwards removed. In the same paper is reported also a case in which there were 26 stones in the kidney of a boy 8 years of age. The two important points in the paper are: (1) The necessity for the *complete* examination in all cases; (2) The necessity for an *x*-ray examination *immediately* before operation. Two interesting papers upon the same subject have been published by George A. Pirie[17] and Edmund Price.[18] The former lays stress upon the point that the *x*-rays should be employed as a routine in all suspicious cases; the latter on the fact of the general reliability of *x*-rays in making the negative diagnosis.

Deanesley,[19] in a paper entitled "Some Practical Points in Operating on the Kidneys and Ureters," has much to say from the surgeon's point of view as to the *x*-ray method of diagnosis. Much that he says is very pertinent, but we can hardly agree with the statement "that a shadow in a given case is that of a stone in the ureter can *never* be positively asserted." In our opinion it is often quite possible to make the positive diagnosis from an *x*-ray examination, quite as possible as in the case of the kidney, when Deanesley admits that it can be done.

Hurry Fenwick's[20] paper, "Renography," is a valuable contribution

PLATE II.

SURGICAL KIDNEY

Collargol solution in the cysts of a Surgical Kidney.

Note the collargol in the ureter.

C. Thurstan Holland

to the literature of kidney diagnosis. The author has utilized radiography to obtain plates showing the kidney, and any shadow either in it or outside of it, (1) in full expiration, (2) in full inspiration, both with the patient lying down, and (3) a third plate in full inspiration with the patient raised to an angle of 45 degrees or more. Tracings of the three plates are taken on the same piece of paper, and then the range of movements and their direction also can be studied to ascertain the mobility of the kidney, its rotation as well as its up and down movement, and the relative movements of any shadows present in or about the kidney region. This method of examination is stated to be useful in cases other than stone, such as in the diagnosis of different forms of moveable kidney, cases of carcinoma of the kidney, etc., and the degree of mobility or fixation taken with the symptoms present is a guide to the subsequent treatment.

The use of **Collargol,** originally suggested by Volcker of Heidelburg, for injection into the kidney is finding its place in diagnostic work. Braasch[21] has used a 10 to 15 per cent solution in several hundreds of cases, and has found the injected radiograph of practical value in demonstrating many conditions, such as normal pelvis; hydronephrosis; pyonephrosis; pyelitis; solitary kidney; cystic kidney, etc. Thomson Walker[22] publishes his experiences of this method, with some fine radiographs taken by Ironside Bruce, and in order to get a guide for the more accurate measurement has his ureteral catheter made with alternate *x*-ray opaque and translucent bands, each of which is ½ inch in length. Ironside Bruce[23] read a paper at the 1911 meeting of the British Medical Association on the same subject, and explains the technique in detail. After the ureteric catheter has been passed, the warm 10 per cent collargol solution is injected from an all-glass syringe of 20 c.c. capacity. Inject until the patient feels pain, then remove the syringe, plug the catheter, and expose the plate. Afterwards the plug is removed and the solution allowed to syphon off, the end of the catheter being depressed below the level of the kidney. *Plate II* shows a surgical kidney in which, before the collargol injection, a diagnosis of hydronephrosis had been made. 120 c.c. of a 15 per cent solution were injected without causing any pain, and the radiograph shows each cyst filled up with very little distention of the pelvis itself.

Thoracic Diseases.—In three papers by Dunham, Boardman, and Wolman[24] on the stereoscopic examination of the chest, with especial reference to the diagnosis of **Pulmonary Tuberculosis,** the clinical findings of Wolman are contrasted with the *x*-ray findings of Dunham in a series of 92 cases, each working quite independently; the two reports are then considered together, and in only seven of the cases was there any disagreement, whilst in six of these seven it was only partial and comparatively slight. These results are striking. Dunham takes ten seconds to complete the taking of his two stereoscopic pictures, the tube is displaced 6 cm. in a line parallel to the spine and the anticathode is 25 inches from the plate. The hilus shadow is cast by the

primary branches of the pulmonary vessels with their contained blood, the walls of the primary bronchi, and the lymphatics and fibrous tissue surrounding the structures. The shadows in the lung fields form two groups, the heavy trunks and the fine linear markings. The heavy trunks appear as definite shadows radiating from the hilus shadow towards the periphery, three groups on the right side and two on the left. The research of Boardman and Dunham seems definitely to settle the question of the shadows seen in the lung fields and at the hilus. Probably the blood-vessels and their contained blood account for the greater part of the hilus shadow, the parallel shadows of the bronchial walls helping. The shadows seen in the lung fields are also due to the same causes. In the discussion on these papers Baetjer agrees entirely that the shadows are formed by the combination of the three, namely, by the arteries, veins, and bronchi. Newton Pitt,[25] in the Bradshaw lecture on the results of bronchial obstruction, uses radiography to demonstrate the depressing of the diaphragm, the increased translucency of the lung tissue, and the pushing over of the heart to the other side, in cases of over-distention of a lung due to pressure upon a bronchus from an aneurysm. Jordan[26] discusses the appearances of various **Aneurysms of the Thoracic Aorta**, pointing out the distinguishing *x*-ray features ; and also suggests the possibility of determining the presence of atheroma while there is as yet no dilatation of the aorta. An excavated appearance of the left cardiac border below the bulge of the aorta, when viewed from the front, is suggested as valuable circumstantial evidence confirming the suspicion of atheroma.

Fractures.—Lane,[27] in an address on the operative treatment of **Simple Fractures,** makes some interesting remarks as to the value of radiography. " The advent of *x*-rays compelled surgeons to be more careful of their statements as to the necessity of effecting accurate apposition of fragments, and the temptation to cast discredit on the interpretation of *x*-rays became too strong to be resisted by the surgeon. Now, as far as *x*-rays are concerned, when taken by competent operators with an up-to-date apparatus, the results are in my experience perfectly intelligible, and give a thoroughly reliable indication of the displacement of fragments. Far from exaggerating the difficulties of replacement, they often underestimate them very greatly." Douarre[28] believes that cases of fracture of the transverse processes of the vertebræ without other injury are not so rare as is generally believed, and publishes a case in which a radiographic examination, made about six weeks after a blow on the back, showed a fracture of the transverse processes of the first, second, and third lumbar vertebræ. Probably a more systematic *x*-ray examination of this region in cases of back injury would show these fractures more frequently.

Uterine Conditions.—Fabre, Barjon, and Trillat[29] describe a method of demonstrating the **Fœtus in Utero.** Their technique is (1) That the patient should be placed in the ventral decubitus ; (2) That the tube should be above in a position over the middle of the thighs ; (3) That

a powerful apparatus is necessary; (4) That an intensifying screen should be used; (5) That the tube should be hard, 8 Benoist. We have found this method successful in a case of extra-uterine fœtation.

Teleröntgenography and **Instantaneous Röntgenography.**— Albers-Schönberg[30] shows that teleröntgenography will speedily replace all the other methods of measurement of the heart, owing to the improvement in apparatus and in intensifying screens. Such heart *x*-rays should be taken at a distance of not less than 1½ metres, with an exposure of about $\frac{1}{10}$ second. The maximum correction for the distortion due to projection is 1·4 millimetres for the left ventricle. He considers that a picture taken in this way is much more accurate and true to life than the older orthodiagram, and its production much simpler and quicker. The normal *x*-ray should in every case strike the back of the patient at the same spot, i.e., in the centre line between the apices of the shoulder blades. Using a direct current transformer, he drives a current of 45 to 60 milliampères through the tube, which latter should be carefully adjusted to a degree of hardness of about 5 Wehnelt. The tube will be too soft if the milliampèrage rises to 80, and too hard if it only passes 30 or less.

Stereoscopic Radiography.—The value of this method is not yet fully recognized by radiographers. Leonard[31] discusses its advantages in chest and stomach cases, and illustrates his remarks with stereo-röntgenograms of pulmonary tuberculosis, gastroptosis, and stenosis of the ileum. In pulmonary tuberculosis he states that stereoscopic vision reveals foci of disease which would have escaped observation in the single negative; consolidation, instead of appearing as opaque areas in the lung, receives a plasticity which gives form and mass; in the abdomen, the shadow of the bismuth meal receives a rotundity which shows its true relation to the skeleton, the abdominal parietes, and the other viscera: in the small intestines the plasticity of the shadows renders it possible to trace their entire course through their varying convolutions. Emil Beck,[32] after a review of a large number of cases of all kinds, sums up to the effect that his strong advocacy of stereoscopic work for surgeons is not due to over-enthusiasm or lack of appreciation of the fact that a method in order to be popular must be simple and not too costly; but that his aim is an earnest appeal to the leaders in radiography to employ a method which will make their work doubly valuable, one which will enable the clinician himself to interpret the radiograph, and thus bring this diagnostic agent into more general use. In connection with stereoscopic work, we are indebted to the ingenuity of Howard Pirie[33] for a small and cheap *pocket stereoscope*, with which it is easy to view stereoscopic negatives of any size. The negatives can be placed side by side in a window or in any suitable box lighted up from the inside by artificial light.

References.—[1]*Brit. Med. Jour.* 1911, i, 1172; [2]*Pract.* 1911, 567; [3]*Brit. Med. Jour.* 1911, i, 913; [4]*Ibid.* 1911, i, 915; [5]*Clin. Jour.* 1910, Dec. 7; [6]*Arch. Röntgen Ray*, 1910, Oct.; [7]*Med. Rec.* 1911, i, 528; [8]*Jour. Amer. Med. Assoc.*

1910, ii, 1725; [9]*Arch. Röntgen Ray*, 1911, June; [10]*Brit. Med. Jour.* 1911, i, 669; [11]*Arch. Röntgen Ray*, 1911, Apr.; [12]*N.Y. Med. Jour.* 1909, ii, 705; [13]*Jour. Amer. Med. Assoc.* 1911, i, 1777; [14]*Arch. Röntgen Ray*, 1911, Sept.; [15]*Ibid.* 1911, July; [16]*Liverp. Med. Chir. Jour.* 1911, Jan.; [17]*Edin. Med. Jour.* 1911, ii, 18; [18]*Ibid.* 1911, ii, 21; [19]*Brit. Med. Jour.* 1911, i, 1041; [20]*Ibid.* 1911, i, 748; [21]*Ann. Surg.* 1910, Nov.; [22]*Lancet*, 1911, i, 1627; [23]*Brit. Med. Jour.* 1911, ii, 908; [24]*Johns Hop. Hosp. Bull.* 1911, July; [25]*Brit. Med. Jour.* 1910, ii, 1845; [26]*Ibid.* 1910, ii, 1575; [27]*Ibid.* 1910, ii, 1059; [28]*Arch. d'Electr. Méd.* 1911, May 25 (*Brit. Med. Jour.* Epit. 1911, Aug. 26); [29]*Ibid.* 1910, Dec. 25 (*Brit. Med. Jour.* Epit. 1911, Mar. 11); [30]*Arch. Röntgen Ray*, 1911, July; [31]*Ibid.* 1910, Dec.; [32]*Surg. Gynæc. Obst.* 1911, Jan.; [33]*Jour. Röntgen Soc.* 1910, Oct.

NEW APPARATUS.

In **Tubes** there is a new idea in an arrangement for continuous cooling by means of a blower. Instead of a solid metal rod leading down to the back of the anticathode, there is an open tube to which is connected an indiarubber pipe led away to a pump. By means of a motor, a current of air is blown down this tube against the back of the anti-cathode, which is thus kept cool. As much as 4 milliampères can thus be run through the tube, and a Saboraud pastille changed to the B tint in six minutes through 1 mm. thickness of aluminium. A further advance is found in the **Lindemann[1] Focus Tube.** In this, a window of borate of lithium and beryllium glass is placed in the tube opposite the anti-cathode; this glass is said to absorb only one-fifth of the amount of *x*-rays of medium hardness absorbed by the ordinary glass,

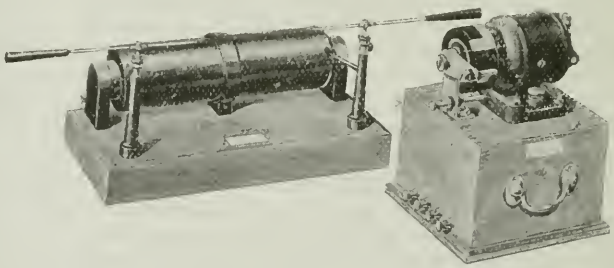

Fig. 1.—Prof. Wilson's Induction Coil.

and has other advantages in that it does not fluoresce, heats only slightly, and gives rise to few secondary radiations. The times of exposure are somewhat shortened by its use, but great care must be observed in both plate-taking, screening, and especially in treatment, as the skin is affected very much more quickly. Albers-Schönberg[2] publishes a paper on this tube, with a number of observations on the skin effects and the lengths of exposure. He thinks that a pad of wool introduced between the tube and the skin guards against any possible dangers. The **Oscillo-thermex,** a combined apparatus for diathermy, high frequency, and *x*-ray work, has been introduced by Messrs. Siemens Brothers & Co. The high-frequency output is capable of a

very large range of adjustment, so that the finest vacuum electrodes can be employed as well as the heavy effleuve brush discharge. The *x*-ray output is claimed to be equal to a normal 12-in. coil *x*-ray plant, the light is remarkably steady for screen work, and the necessary exposure for a hand radiograph is four seconds. Professor Ernest Wilson and Mr. H. W. Wilson have designed a **New Induction Coil** (*Fig.* 1), embodying improvements in the direction of increased portability and efficiency. It is operated direct from any lighting main, whether continuous or alternating, by the mere insertion of a plug. The complete apparatus weighs only 33 lbs. The coil gives a 10-inch discharge between its secondary terminals. *Fig.* 1 shows the coil and interrupter, and *Fig.* 2 the method of the connections, in which 1 is the winding of the induction, or choking coil; 2 and 3 the primary and the secondary windings of the spark-coil; 4 is the condenser; 5 is the interrupter. Three brushes (*a*, *b*, *c*) bear upon the cylinder of the break: brush (*a*) makes contact with the segment once in every revolution; brush (*b*) is always in contact with the segment; brush (*c*) makes contact with the segment once in a revolution. The novelty consists in feeding the sparking coil by sudden short jets from the condenser, instead of the comparatively slow intermittent feeds from an interrupted current, as in the ordinary method. A full description of the apparatus is to be found in the *Archives of the Röntgen Ray* for June, 1911, and in the report of the Electro-Therapeutic Section of the Royal Society for Medicine for March, 1911.

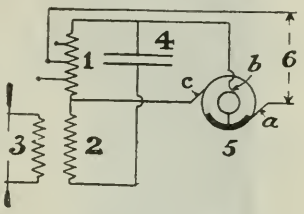

Fig. 2.—Connections.

References.—[1]*Zeits. f. Roentgenkunde*, 1911, Ap.; [2]*Fortschr. a. d. Geb. d. Roentgenstrahlw*, 1911, Sept., in *Arch. Röntgen Ray*, 1911, Nov.

TREATMENT.

Measurement of Dosage.—Stein[1] describes in detail the exact method of using Holzknecht's new *radiometer* for the more exact measurement of the *x*-ray dose (*Fig.* 3). This has a graded colour scale and a continuous colour scale; a half Saboraud disc is fixed under the sliding scale, and the exposed pastille, which is also half a disc, is placed in juxtaposition, so that the two half discs form one complete circle. The slider is then passed underneath the graduated scale until the two half discs exactly correspond in colour, and then the reading in Holzknecht units is automatically read off. This instrument is a distinct advance over any method as yet invented, and the optical exactness of the apparatus is self-evident. The reading has to be made by the electric light, and not by daylight, and it is possible to measure off as small a dose as ¼ H. Another valuable instrument, especially in treatment, is *Bauer's qualimeter*.[2] Essentially it is a static electrometer of two fixed metallic plates, between which swings a sort

of pendulum. An index attached to the pendulum passes over a suitably divided scale, and thus the simple movement of the index—an objective phenomenon—indicates the exact quality of the *x*-rays issuing from a given Röntgen tube. The instrument thus enables the operator to watch and to regulate the tube during the whole course of its action. Bordier[3] describes the latest model of his *chromoradiometer*, in which all the standard tints are mounted across a slit on a single card. The pastille is passed along the back of the slit in the card until it matches one of the tints; the comparison should always be made by diffuse daylight. Stress is laid on the point that in using this instrument the installation should be about the same power as that used in standardizing the scale, i.e., that for tint 1 the discoloration should be obtained in not more than eight minutes. Bergonié and Spéder[4] state that the advantages of this chromoradiometer are: (1) Easy adjustment of the focus tube, since the pastille is fixed to the skin; (2) Measurement of the real filtered dose; (3) Freedom from burns, as the pastille is placed on the skin nearest to the tube and in the direct ray, and so receives the maximum dose coming off; (4) Exact determination of the dose by comparison with the colour scale.

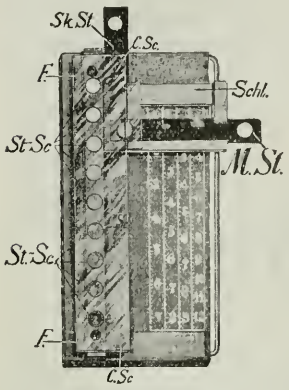

Fig. 3.—Holzknecht's Radiometer.

In the treatment of **Ringworm,** Howard Pirie[5] places the pastille on the scalp, and exposes until it is $\frac{1}{4}$ the B tint by electric light, when the area will have received an epilation dose, no matter what distance the tube was placed from the skin. He takes fifteen minutes in actual time of exposure to treat an entire scalp by the five-exposure method. Doré[6] reviews the present position of the *x*-ray treatment of ringworm, and advocates an average exposure of fifteen minutes for each area in the five-exposure method. He thinks that shorter exposures do not allow of a sufficient margin for slight errors of dosage. Permanent baldness, if it occurs, is due to the employment of an unskilled or a careless operator, or to the use of unsuitable tubes.

Fig. 4.—Qualimeter.

Sir J. J. Thompson[7] made a very important announcement at the meeting of the British Medical Association in 1910, that Barkla had discovered that when a piece of metal, or any substance, is struck by *x*-rays, that substance gives out Röntgen rays of a special quality,

which are constant for each metal; and that the hardness of the ray given out by the metal increases as the atomic weight of the metal. He suggested that there are possibilities for this discovery which might lead to results of medical importance. Hernaman-Johnson,[8] following out this idea, has treated cases of **Ulceration of the Cæcum, Gastric Ulcer,** etc., by giving the patients doses of metallic silver before subjecting them to *x*-ray treatment, and claims considerable success. The time to give the treatment, after administering the silver, is estimated by watching a bismuth meal to the affected area in the first place.

New work on the influence of *x*-rays on the *thymus* comes from Rudberg.[9] In rabbits it was found that both the lymphocytes and the cells of the reticulum undergo rapid involution. The degeneration of the lymphocyte commences within three hours of the exposure. Within forty-eight hours of indirect exposure to the rays the gland loses half its weight.

Diseases of Spinal Cord.—Beaujard[10] reports enthusiastically on the results in **Syringomyelia.** He treated eight cases, all of which ameliorated; motor troubles and disorders of sensibility begin to disappear after the third or fourth weekly sitting. Two cases of **Multiple Sclerosis** showed a noteworthy improvement. He employs very penetrating *x*-rays, at least 6 Benoist, a filter of 1 mm. of aluminium, and a dose of 3 H on the skin, and gives from four to six weekly sittings. Marinesco[11] also reports good results in syringomyelia and multiple sclerosis. Duhain in syringomyelia analyses the results of 40 cases of different observers, and reports definite amelioration in five-sixths of them. The increase of muscular force, the return of tactile sensibility, the disappearance of the trophic troubles and the œdema suffice to raise the general condition. The *x*-rays are thought to act by destroying the hyperplastic elements which compress and destroy, little by little, the nerve elements.

Cancer.—Barkla[12] (Professor of Physics, King's College, London), writing on radiations given out by metals when these are irradiated by a stream of *x*-rays, remarks that where there is little absorption there is little ionization, and we may certainly expect—indeed it may safely be asserted—that there is little physiological effect. Penetrating radiations, when passing through the light atoms which constitute flesh, lose by far the greater portion of their energy by simple scattering and not by true absorption. The absence of appreciable physiological action follows as a consequence. The suggestion from this is, that a substance containing a heavy element should be injected into the diseased portion of the body, then the intensely penetrating rays will pass through the surrounding tissues, and will, in the diseased tissues, be transformed into highly efficient ionizing radiations, which are practically completely absorbed within that diseased tissue.

In the *x*-ray treatment of **Cancer of the Breast,** Boggs[13] suggests that the different results obtained by different workers are largely due to variation of technique. The *x*-rays are the only therapeutic method, in inoperable cases, that will cause cessation of pain and

hæmorrhage, disappearance of offensive odours, and arrest of the disease. This palliative treatment should never be denied to a patient. Both ante-operative and post-operative treatment is strongly urged, and in some cases ante-operative *x*-ray treatment has rendered inoperable cases operable; while post-operative treatment has promoted healing, diminished scarring, and postponed or prevented recurrences. Riddell[14] writes that it cannot be too much insisted upon that the administration of the *x*-rays, except in carefully measured doses, is absolutely inexcusable. In operable cases of *malignant disease* he is strongly of opinion that a short course of *x*-rays should be administered, perhaps before, but certainly after, excision. The risk of recurrence is thereby lessened.

Bordier[15] publishes an important communication summing up the results of his work on **Uterine Fibromata.** The technique is essential for success, and should be thoroughly mastered. The tube used is one with a water-cooled anticathode, giving exceedingly penetrating *x*-rays, Nos. 11 and 12 on Benoist's radiochronometer. Adequate filtration is of great importance, and he employs as filters sheets of aluminium of varying thickness, from 0·5 mm. to 3·5 mm. Each series of treatments consists of nine irradiations as follows:—

The *first day* the two sides are treated in succession, using a filter 1 mm. in thickness. One of the sensitized pastilles is attached to the skin to be irradiated, and a dose of 1·5 I to 2 I (Bordier) is given. *Second day*, the patient rests. *Third day*, median irradiation with a filter 2·5 mm. thick, and with a similar measured dose. *Fourth day*, rest. *Fifth day*, both sides irradiated through a filter 1·5 mm. thick (same dose). *Sixth day*, rest. *Seventh day*, median irradiation with a filter 3 mm. thick. *Eighth day*, rest. *Ninth day*, irradiation of the two sides with a filter 2 mm. thick. *Tenth day*, rest. *Eleventh day*, a final median irradiation with a filter 3·8 mm. thick.

By this series of irradiations, which represent six days of treatment, the fibroma and ovaries are submitted to a crossed fire of *x*-rays. After the series the patient rests for three weeks, and then a second similar series is given; another rest of three weeks, and then a third series follows. Sometimes this is the last, but in general a fourth, or even a fifth, series is necessary.

As regards the *indications* for this treatment, fibromata of apparently recent development, four or five years, profit most completely whatever the size of the tumour. Fibromata of twelve or twenty years standing are but slightly atrophied. Degenerating fibromyomata, fibromata with hydrorrhœa, and cystic fibromata do not justify radio-therapeutic treatment. A complete history of 18 cases is given in the paper, and the results of many are guaranteed by Professor Pollosson, the Professor of Clinical Gynæcology of the Faculty of Medicine of Lyons. As an example of a case, No. 1, a woman of 39 years, had a fibroma reaching a finger's breadth above the umbilicus; five series of irradiations were given between November, 1908, and April, 1909. In October, 1909, Professor Pollosson states that "it was actually

impossible to diagnose in this patient the presence of a uterine fibroma."

Skin Diseases.—Nadler[16] reports a case of **Scrofuloderma** treated by *x*-rays in a boy who had had two previous operations. The case had three series of treatment, 14 exposures in 1908, 15 exposures in 1909, and 2 exposures in 1910. The result was cure. In **Acne Cheloid,** Belot and Govin[17] prefer *x*-rays to radium, and consider that the latter should be regarded only as an adjunct to *x*-rays. Halls-Dally[18] has treated 82 cases of **Favus** with *x*-rays, watching the results microscopically: in only one case was the fungus found to be present one and a half years later. During six months 50 cases were discharged cured and 24 admitted. In the next six months 20 were cured and 7 admitted. Three months later the stock of available cases had become exhausted. Failing the introduction of fresh cases through alien immigration, the disease is therefore practically stamped out. The method of treatment adopted was first to cut the hair short and to remove crusts with poultices. Following this, to expose to *x*-rays by the 5-area method of Kienbock and Adamson, each case taking about one hour. Eighteen days later the head is washed, and then for three days a cylline poultice applied daily. Following this, unless contraindicated, pure izal or cyllin is painted on once weekly. A new growth of hair appears in about nine weeks from this. It is generally accepted that **Paget's Eczema of the Nipple** does not usually react to *x*-ray treatment; Aldridge[19] reports a case, not however examined microscopically, which was completely cured. The dosage was as follows: From October 27th to December 29th, nine unfiltered doses of three-quarters of a pastille dose each, followed by eight weekly full pastille doses filtered through aluminium. The filter was used on account of slight dermatitis supervening. (See also paragraphs on various skin diseases.)

Filtration of X-Rays.—Pirie[20] is a strong advocate of *aluminium* as opposed to felt, leather, etc., for the following reasons: (1) Physicists state that aluminium cuts off proportionately more soft rays, and lets through more hard rays than any other substance; (2) It is clean to work with and homogeneous in texture; (3) It can easily be kept at such a distance from the patient's skin that soft secondary rays from it (see note on Sir J. J. Thompson's paper) do not affect the skin. He exposed two Sabouraud's pastilles at a distance of 2 cm. from a Bauer tube of hardness of 3 Benoist; one pastille, covered with a layer of aluminium 1 mm. thick, required three times the exposure that the naked pastille required to turn it to the B tint. The most efficient position for this filter is undoubtedly near to the tube and far away from the skin.

Precocious X-Ray Reactions—These have been systematically studied by Bergonié and Spéder,[21] and are divided by them into three groups: (1) Superficial precocious reactions, in which it has been noted that, within two or three hours after exposure, the skin may be lightly tumefied, dry, and occasionally painful. Epidermic pellicles may

appear in from eight to ten hours, and the phenomena disappear at the end of ten or twelve days. (2) A second group includes those in which the effect is deeper, such as troubles of sensation ; for example, cephalalgia or neuralgia over the area of the trigeminus, a few hours after exposure upon the head ; extreme dryness of the mouth or throat lasting a day ; bilateral parotiditis five hours after a sitting, during which both cheeks had been treated ; gingivitis ; the expulsion of ascarides ; difficult micturition ; relief of constipation, etc. (3) The third group are what are termed "general" reactions ; such as fatigue, slight fever, shivering and faintness, occasionally high fever with vomiting and nausea.

A list of 23 detailed observations is appended in which precocious reactions occurred.

References.—[1]*Med. Rec.* 1911, i, 904 ; [2]*Arch. Röntgen Ray*, 1911, Jan. ; [3]*Ibid.* 1911. June ; [4]*Arch. d'Electr. Méd.* 1911, Jan. 10 ; [5]*Arch. Röntgen Ray*, 1911, Ap. ; [6]*Lancet*, 1911, i, 432 ; [7]*Arch. Röntgen Ray*, 1910, Oct. ; [8]*Brit. Med. Jour.* 1911, i, 1313 ; [9]*Ibid.* 1911, i, 1318 ; [10]*Arch. d'Electr. Méd.* 1910, Mar. (*Brit. Med. Jour.* 1910, ii, 27 Epit.) ; [11]*Ibid.* 1911, Ap. 10 (*Brit. Med. Jour.* 1911, June 3, Epit.) ; [12]*Brit. Med. Jour.* 1910, ii, 1532 ; [13]*N.Y. Med. Jour.* 1910, ii, 695 ; [14]*Glasg. Med. Jour.* 1911, May ; [15]*Arch. Röntgen Ray*, 1911, Aug. ; [16]*Jour. Cutan. Dis.* 1910, Nov. ; [17]*Arch. d'Electr. Méd.* 1911, Jan. (*Brit. Med. Jour.* 1911, i, 88, Epit.) ; [18]*Arch. Röntgen Ray*, 1910, Oct. ; [19]*Brit. Med. Jour.* 1911, ii, 620 ; [20]*Jour. Röntgen Soc.* 1910, Oct. ; [21]*Arch. d'Electr. Méd.* 1911 Mar. 25 (*Brit. Med. Jour.* 1911, i, 69, Epit.).

RADIUM.

General.—During the past year it has become evident that radium treatment is gradually settling down to its proper place in medicine. Its limitations are better understood, and its therapeutic possibilities are in consequence more accurately known. At the Birmingham meeting of the British Medical Association, in the section of electro-therapeutics, Deane Butcher[1] admirably summed up the present position of radium in a well-reasoned and critically correct paper, neither erring on the side of over-rating its properties and the results to be expected from it, nor on the other hand under-estimating its great possibilities. The chief points made were : (1) That in small circumscribed lesions of the skin and mucous membranes, and in all small growths whose malignancy is suspected, radium treatment is indicated ; (2) That it is the treatment of choice for **Nævi** and for any diseases of the skin associated with pain and itching—indeed, that for **Pruritis** it is absolutely the very best remedy known ; (3) That in deep-seated cancer he had never seen a perfectly satisfactory result, but that experimentally, cancer implanted in the mouth does not grow if subjected to the action of radium ; (4) That the hæmostatic action of radium is very marked, pushed into a vascular tumour it will arrest bleeding, and thus it can with safety be introduced into the substance of such growths ; (5) That the great advantage of radium over the knife lies in the fact that it produces its effects upon growths without opening blood-vessels and lymph channels ; and therefore, if this great advantage in treatment is to be obtained, any preliminary

removal of a bit of the growth for the purpose of microscopic examination should not be made.

In the discussion which followed the paper, Sequeira uttered a note of warning against the idea that radium was a specific in all cases of **Rodent Ulcer,** and pointed out that in cases in which either bone or cartilage was affected, the chances of success were but slight. Dr. Holder, of Hull, made some very pertinent remarks on the *treatment of large tumours*, and in attempting to get rid of them too quickly. His idea being that over-treatment would close up the lymphatic sewerage system, thereby causing rapid disintegration, and a general in place of a local infection.

On the *general question of radium therapy* there is an interesting address by Wickham,[2] commendable for the restraint of the author. In it the methods of application, the screens to be used, and the various diseases amenable to radium treatment are fully discussed. In a case of **Cancer of the Breast,** 15½ cms. in width, 19 cgrms. of pure radium sulphate, spread on shields 28 cms. square, were applied for forty-eight consecutive hours. During the exposure an electroscope and a screen of platino-cyanide of barium were held on the opposite side of the breast, and both instruments showed the influence of radium emanations, the former in from eight to nine seconds. Before the exposure the breast was a hard, bossed, homogeneous mass, but sixteen days later it had shrunken 1 cm. in width, and palpation revealed a series of nodules. The breast was then amputated, and on section one could see that the portion of the tumour lying directly in the path of the rays differed totally from the remoter zones. The action on the epithelial cells was destructive, affecting the whole cell-body, nucleus, and nucleolus. The action on the stroma showed itself by the presence of young connective tissue penetrating and breaking up the tumour mass. Disappearance of neoplastic elements and subsequent cicatrization—this is the apparent action of radium. The author claims to prove that a quality inherent in radium, as in *x*-rays, is its selective action, and bases his opinion on positive microscopical facts: thus, that "we find that sebaceous and sweat glands lying between the skin and underlying cancer were hardly affected, while the deeper cancer cells were actually destroyed." Another quality of radium, or, more properly speaking, an absence of quality, is its strictly local action; in this respect differing from *x*-rays. Apart from certain reservations as regards superficial disease, "in malignant cancer of the rest of the body we must regard radium merely as an adjunct to the surgeon. Operation and excision should always come first, if possible, and a radiologist who ignores this view-point renders himself culpable in the eyes of the best modern medical thought. *Per contra,* the surgeon who is ignorant of, or blind to, the possible therapeutic aid of radium treatment, errs equally towards his patient." Bruce,[3] of Toronto, thinks the best results are to be seen in cases of large **Angiomata** in children, and discusses *in extenso* the general results of the work seen in Paris. Harris,[4] of Sidney, has used radium in 60 cases,

and his best results have been obtained in cases of **Rodent Ulcer,** the scars left being smooth, flat, and healthy. The *x*-rays in his hands have given similar results. But in very indurated cases radium is preferable. The next best results have been in cases of **Port-Wine Stain** and deep **Angiomata. Keloid** responds very well, and the good result is obtained more rapidly than with *x*-rays in his experience in the treatment of over 100 such cases. Guyenot,[5] in an address on radium and radio-activity, discusses the action of radium on bacteria and on the nervous system, and the experimental results of exposing mice, guinea-pigs, etc., to the action of both radium and radium emanations. He points out that the results of treatment are singularly alike in the work of both German and French investigators, the former relying upon ingestion of water laden with emanation, the latter using mainly baths and mud poultices. The cases yielding to these methods of treatment include **Muscular Rheumatism, Chronic Arthritis, Neuralgias, Catarrhal Affections** of the respiratory tract, and certain cutaneous and gynæcological affections.

Malignant Disease.—Finzi[6] has an important paper on his experience in the treatment of over 100 cases, of which the following is an abstract. He first draws attention to the important bearing of the state of the patient's health in the commencement and spread of the disease, and the necessity of treatment directed at increasing the patient's resistance. A brief and concise account is then given of the physics of radium and their bearing on treatment, especial stress being laid on the fact that, using radium in tubes, the intensity of the rays varies as the square of the distance. The action of the β and γ rays on growths depends on their power, much more marked in the case of the γ rays, of destroying growth-cells in doses which are harmless to healthy tissues. Apparatus is therefore used in which the rays are filtered through $1\frac{1}{2}$ or $2\frac{1}{2}$ mm. of platinum, so as to obtain a large proportion of γ rays. With different growths the ratio of the dose which destroys healthy cells, to that which destroys growth-cells, varies, probably reaching 20 to 1 in the most favourable cases, but more usually being about 5 to 1 in a hopeful case. This ratio is much greater than is the case with *x*-rays. Retrogression of metastases has been observed on the treatment of a primary growth, but never complete disappearance ; thus the necessity of treating every metastasis. The class of case suitable for treatment depends on (1) The nature of the malignant growth ; (2) The position and size of the deposits ; and (3) the general condition of the patient. The principles of the treatment are (1) To treat thoroughly the whole tumour and the site of any possible metastasis ; (2) Adequately to filter the rays ; (3) To use as much radium as possible (the author uses habitually 205 mg. of radium bromide ; (4) To give maximal doses.

The author uses a small and convenient apparatus, designed by himself, of which a diagram and description are given. The results of the treatment of inoperable cases at the time of writing were as follows : Total disappearances of the growth 15, with 5 recurrences, in 80 completed cases ; very great relief in 10 cases, substantial relief

in 30 cases, and no relief in 25 cases. The general conclusions arrived at are: (1) That in cases which would otherwise be doomed, complete local disappearance of the growth occurs in about 12 per cent, relief of pain and other symptoms in 62 per cent, and no relief in 25 per cent; (2) That the statistics would be improved if cases were excluded which were treated for relief only; (3) That every local inoperable growth of suitable type should be treated with radium; (4) That prophylactic treatment should be used after every operation for cancer; (5) That it is necessary to use large quantities of radium, and metal filters of at least 1½ mm. thickness of lead or platinum; (6) That the treatment must be thorough.

C. J. Morton[7] obtains his best results with applicators containing 2½ mg. of pure radium to each sq. cm. The majority of his cases were in an advanced stage of the disease, and in only two was the cancer still in an operable condition. He quotes six cases in full: some in which the treatment was successful in retarding disease, others in which no benefit resulted, and one in which pain appeared to be aggravated by the treatment. Summing up his results, the author considers that there is no doubt that some varieties of cancer are much more responsive to radium than others, with few exceptions it is the slow-growing cases which react best. At present the position of radium therapy seems to be that, while it is of undoubtedvalue in many cases, its chief function is in aiding and not excluding the other recognized methods of treatment. A point of practical importance is that in the cases in which radium acts beneficially it acts at once; within fourteen days of the beginning of treatment, an unquestionable diminution in size will be found in *all* cases in which radium is able to exert a regressive effect. If no improvement is apparent at this time, further treatment is useless, except, perhaps, for its palliative effect.

Mansell Moullin[8] denies that radium has any cumulative action, a second exposure is more destructive than a first, not because the influence of the radiation is cumulative, but because the resistance of the tissues has been lowered, and they have not yet had time to recover. Similarly, radium has no selective action, the difference in effect on different cells, etc., depending upon the different powers of resistance offered by the tissues. The success of radium in the treatment of malignant growth depends upon the greater susceptibility of malignant cells under certain conditions of application. The author goes on to discuss in detail the question of metastases, and the particular varieties of malignant tumour in which radium is most successful, and gives his reasons as to why radium is effectual in some cases and ineffectual in others. Monod,[9] in discussing a paper by Wickham, expresses as his view that "radium exerts no more than a local action on cancer, and certainly cannot prevent spread of the disease, recurrence, or metastases. Its *rôle*, however, when it is properly applied, is very useful, and may prove of great importance if it enables the surgeon to effect complete destruction of the disease." He urges surgeons and radium therapeutists to work together in

perfecting the methods of application, and in thus obtaining the best possible results from this treatment. Snow[10] records a case of giant-cell **Sarcoma** (microscopic examination) extending from the middle of the outer phalanx of the hand to above the ulnar prominence of the wrist, into which a glass tube containing radium bromide (amount not stated) of 50,000 radio-activity was introduced and left in position for eleven days At the end of that time the surface of the tumour presented a pinkish appearance, and considerable reaction extended to the elbow. Two months later a microscopic examination showed a mass of broken-down tissue and no cells resembling sarcoma. The wound healed rapidly, and one year later there was no sign of any growth. Aikens and Harrison[11] report a case of small, round-celled sarcoma at the angle of the jaw, unaffected by *x*-rays, which disappeared after the introduction into the tumour of a silver tube containing 1 cg. of pure radium bromide for twenty-four hours, and twelve days later for another two hours.

Diseases of the Eye.—Lawson and Mackenzie Davidson[12] cocainize the eye in the first place, and then apply the radium in sealed glass tubes. In no single case have any bad effects been observed. The authors consider 20 mg. amply sufficient for these cases; the time limit of exposure was five minutes, and the dose repeated as the gravity of the case and the symptoms required, full details being given in the list of cases published. The immediate effects of applying radium directly to the eye in this manner are practically nil. Some pain may follow in the course of a few hours, and last about twenty-four hours, but it is not as a rule severe; a rapid improvement in subjective symptoms is a very striking feature. A certain number of cases did not respond favourably, but in those which did so the effect produced was a manifest improvement. The cases selected for treatment may be divided into four groups: (1) Ulcerations of the cornea; (2) Non-ulcerative acute inflammations of the cornea and sclerotic; (3) Affections of the lids; (4) Corneal scars.

In the first group rapidity of improvement after the first exposure was nearly always a striking feature. One or two very good results followed in the second group. Radium acted as a specific in the treatment of spring catarrh. The treatment of old corneal nebulæ was not encouraging.

The Brain.—Victor Horsley and Finzi[13] publish some experimental work in a paper read before the British Medical Association in 1911. This work consists of experiments on the *action of filtered radium rays applied directly to the brain*. The rays were used from apparatus containing respectively 27·7 and 47 mg. of pure metallic radium contained in a platinum tube 0·5 mm. thick, and encased in a rubber tube 1 mm. thick. These were applied directly to the brain of monkeys, to the pre- and post-central gyri and to the occipital lobe, by a trephining operation, the tubes being placed under the dura mater. Doses up to four times the maximal dose which can be applied to the healthy skin without damage were given, the animal being anæsthetized during the whole of this period, which in one case was nearly four hours. No symptoms

whatever were produced, the movements represented in the treated areas being perfectly normal. The animals were killed at times varying from the sixteenth to the forty-fifth day from the experiment. The following changes were noted: (1) The leptomeninges were greatly thickened with young fibrous tissue; both pia mater and arachnoid were infiltrated with erythrocytes. (2) Endothelial proliferation was also observed, in some places practically occluding the lumen of the vessel. (3) Punctiform hæmorrhages were seen in the cortex, which could be traced to a commencement in the perivascular lymphatics. In one animal, small collections of leucocytes were also seen. (4) Wedge-shaped areas of thrombosis, with the apex in the lowest cell-layer of the cortex, were found, and the nerve cells in these areas showed marked change. (5) The other nerve cells in the irradiated area showed hyperchromatosis, but no other change. (6) Degenerated nerve fibres were traced from the thrombotic areas into the rest of the brain and spinal cord by the Marchi method.

The authors conclude that these filtered radium rays, which contain both penetrating β and γ rays, exert no influence on nerve tissues, but cause notable changes in the blood-vessels.

A preliminary note on the *effect of radium on the healthy tissue cell* comes from Percival Mills,[14] who exposed the liver area in mice, through the anterior abdominal wall, to an applicator of 500,000 units, cutting off the α and β rays and allowing the γ rays to pass. This was applied for thirty minutes in each case; the mice were killed at varying intervals after exposure, and the liver was examined microscopically. The earliest definite changes noticed occurred about one hour after irradiation—a transient change in the liver cells somewhat resembling "cloudy" swelling—and was most noticeable three hours afterwards. Whilst these changes were found in the liver generally, there was in most sections a place near the edge where the cells had suffered a greater and permanent change. The outline of the cell was lost, and the condition resembled coagulation necrosis. Presumably this mass of necrosed tissue corresponded to the spot immediately over which the radium was applied. In sections taken 14 and 15 days after irradiation, there were obvious signs that a second or late reaction was taking place, consisting of a marked general infiltration of the liver with lymphocytes, connective tissue cells, and a few polymorphonuclear leucocytes. These changes were associated with a general hyperæmia, and 20 days after the dose the liver was still in a similar condition.

Radium Emanation.—Engelmann[15] reports upon the present position of this method in Germany, pointing out that the interest awakened in all health resorts has considerably lessened since it was ascertained that, although these springs contained such emanations, few possessed them in sufficient quantity to be of therapeutic value. The author discusses in detail the value of the Kreuznach springs, which are not only radio-active in a high degree, but deposit a sediment "sinter" which is also impregnated. He maintains that in the bath treatment he has proved that emanation penetrates the skin, and can be taken up

well by the body ; it has also been proved beyond doubt that cures or considerable improvement have been observed after drinking radium-emanation water. Experiments on rabbits are quoted in support of these views. A combination of these methods of treatment is suggested. Emanation water should be taken two or three times daily, followed by a lengthy emanation bath, and finally the effect is strengthened by remaining in an emanatorium or by the use of an inhaler. This energetic treatment is recommended for general assimilatory diseases, especially cases of gout. Armstrong,[16] in a paper on *radium water therapy*, analyses his results in 400 cases. He uses the maché unit for the purpose of measuring the dose, this unit being the one-thousandth part of an ordinary electro-static unit. For drinking purposes the water is prescribed in quantities of ½ to 1 litre daily, the strength being from 1000 to 8000 units. For bathing the strength is from 5 to 15 units per litre, and for inhalation 1000 to 8000 units. The general physical results observed are as follows : (1) Greatly increased diuresis ; (2) Increase of exhalation of carbonic acid gas ; (3) Marked lowering of blood-pressure ; (4) Improvement of digestion ; (5) Disappearance of gouty deposits ; (6) Increased vitality ; and so on. Wilhelm His[17] has obtained good results in chronic **Rheumatism, Myalgia,** and **Gout.** In 100 cases of the former 47 were improved, 29 considerably improved, 5 nearly cured. In one patient, a child 8½ years of age, who could use neither hands nor feet, after eight weeks' treatment the power of walking and the use of the hands returned. Out of 28 cases of gout, 24 showed marked improvement. The author considers that in these cases the most remarkable effect is to be noted in the behaviour of uric acid in the blood. Under the influence of radium emanation the blood loses its uric acid within a few weeks. He also saw tophi in the ear disappear on two occasions. This paper discusses the mode of application, the dosage, the mode of action, and the emanation itself ; and the notes on the selection of suitable cases for the treatment are extremely valuable. To quote the author : "In selecting cases for radium treatment, the form of disease should be taken into account in the first place. Before the practitioner prescribes a treatment which must be continued for weeks or months, and which will involve the patient in a considerable financial outlay, he must form a clear conception of the results which can be obtained under the most favourable conditions."

In **Gynæcological Conditions,** Madame Fabre[18] has used both radium, weak solutions of radium, also the various radio-active deposits, and mud from radio-active springs. She points out that in cases of cancer, of ovarian cysts or fibromata of large volume, when the life of the patient is in danger, it is dangerous and even criminal to have recourse to medicinal treatment, except for the suppression of symptoms and in order to prepare the patient for surgical intervention. Radium itself is used by the introduction of it and the filter into the interior of the uterus ; or with large tumours—such as fibromata—flat applicators are applied over the abdominal wall. Each case requires its own particular treatment and mode of application, the choice of which

can only be determined by experience. Radio-active muds can be applied to the surface or the interior in certain cases with good results. Radium irradiation, owing to its hæmostatic action, is useful in **Metrorrhagia.** On the true tissue of fibromata the author has not seen any curative action, and the diminution in volume of the tumour is due to the shrinking of the peri-uterine inflammatory tissue. In the group of acute inflammatory affections, chiefly of gonococcic origin, radio-active mud applications are useful (a complete bath of 250 to 300 grammes of the mud for twenty minutes, local applications of the mud for from five to twelve hours, or prolonged vaginal injections with sterilized mud in suspension, 20 grammes of mud in 2 litres of water). These applications act by rapidly arresting the discharge, suppressing the pain and itching, and ameliorating the other painful symptoms, such as urethritis.

Harel[19] has introduced *a new method of radium therapy*, by which radium is introduced into the pathological tissue by driving the radium ions through the skin by electrolysis. A compress soaked in a solution of radium bromide containing 10 microgrammes of the salt per c.c. is applied to the area to be treated, and is connected with the positive pole of the battery ; a current of 10 milliampères is passed for half an hour three times weekly. Experimental researches on animals showed that the radium penetrates through uninjured skin to a depth of 9 centimetres at least. In ten cases of neoplastic growth the most noteworthy was that of a large **Sarcoma of the Scapula,** detailed notes of which are given.[19] Zimmern and others have used the same method of electrolysis in chronic joint conditions, applying radio-active mud to the joints, and good results are recorded.

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IONIC MEDICATION.

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Principles.

By means of the electric current, drugs may be introduced into the human body through the intact skin or mucous membranes, toxic or therapeutic results following. An understanding of the mechanism of this procedure depends upon a knowledge of the effects of the electric current on solutions. A solution is a homogeneous mixture of the solvent with the substances dissolved.

The term "*concentration*" denotes the proportion of the substance dissolved to its solvent; it is expressed in molecule-grams, terms of molecular weight in grams per litre of solution. A "*normal*" solution contains one molecule-gram per litre of solution. In regard to medical uses, concentration is often described in terms of the weight of the substance in 100 grams of solution, or more often still in 100 grams of water.

Certain solutions, especially those of organic substances (sugar, urea, etc.), are non-conductors of electricity. Solutions of organic salts, acids, and bases are much poorer conductors than mineral solutions; to make the former transmit a current as intense as the latter a much greater electromotive force must be employed, though this is no bar to its use in medical practice.

Solutions conducting electricity are called *electrolytes*. The terminals dipping in the solution, by which the current enters and leaves, are termed *electrodes*. The electrode connected with the positive pole of the battery is the *anode*, while the other, connected with the negative pole, is the *cathode*.

An electric current passing through a solution breaks it up into radicles or *ions*; those which go to the cathode are *cations*; to the anode, *anions*.

The decomposition of salts, acids, and bases, into two radicles by the current, leads to the view that they are formed by the union of these two radicles, anion and cation. The latter are represented by metals and metallic radicles, the former by acid radicles. This likeness of composition makes it possible to group acids, salts, and bases together; acids are salts of hydrogen, since in them hydrogen fulfils the function of the metals, for which it is a substitute, and by which it may be replaced; bases may be regarded as salts whose acid radicle is OH, which may replace or be replaced by acid radicles.

The action of the electric current is explained by postulating that the ions carry electric charges: the anions negative charges, the cations positive; when the electrodes are dipped in the solution, the positively-charged anode attracts bodies carrying a negative charge, i.e., anions, and rejects the cations, since they carry a positive charge; and vice versa in the case of the negatively-charged cathode. Under the influence of these attractions and repulsions, the ions are set in motion, the anions carrying their negative charge to the positive anode to neutralize it, while the cations take their positive charge to the cathode, where they neutralize a negative charge equal to their own. The battery sends to the electrodes fresh supplies to compensate for the neutralized charges, transported as an electric current through the metal conductors which connect the battery with the electrodes, while in the solution the current results from the carriage of charges by the ions.

Not all the dissolved molecules are split up into their ions; there is always a fixed relation between the number of split-up molecules and that of the intact molecules; there is, therefore, a fixed relation ($\frac{n}{N}$, called the degree of dissociation) between the dissociated molecules (n) and the total number (N) of molecules in solution.

It follows that a solution, of sodium chloride, for instance, will contain three kinds of particles: intact, electrically neutral molecules of NaCl, electro-negative anions $\overline{Cl}$, and electro-positive cations $\overset{+}{Na}$.

Dissolved substances behave like gases or vapours, spreading through the solvent with a certain measurable, "*osmotic*" *pressure*, which follows the same laws and has the same physical constants as in the case of gases and vapours, being, as in these cases, proportional to the molecular concentration, i.e., to the number of molecules dissolved in a litre of solution. The osmotic pressure is measured by cryoscopy, i.e., by the lowering of the freezing-point of the solution in relation to that of pure water, this lowering being proportional to the molecular concentration. In solutions conducting electricity the freezing-point and osmotic pressure are always greater than the molecular concentration would indicate, because of the dissociation of molecules into ions which, from the point of view of osmotic pressure and freezing-point, behave like independent molecules. Electrolytic solutions, containing n molecules per litre, behave as if they contained per litre a number $n' > n$; the number $n' = in$, i being a factor greater than unity, called the "*co-efficient of dissociation*"; all the magnitudes proportional to the molecular concentration, in relation to electrolytic solutions, should be multiplied by the co-efficient of dissociation to give the real magnitudes. The greater the number of molecules dissociated, the higher the value of the co-efficient i, which $= 1$ if no molecules are dissociated, $= 2$ if all are dissociated and each yields two ions, $= 3$ if all are dissociated and each yields three ions, and so on. The constancy

of the relation between the number of molecules dissociated and those remaining intact, is maintained during the passage of the current and the liberation of ions to the electrodes by a fresh dissociation of molecules hitherto intact.

The majority of chemical, toxic, and therapeutic actions of electrolytic solutions are ionic in nature. Thus, a solution of silver nitrate precipitates silver chloride when treated with chlorine only when in solutions such as that of chloride of sodium or potassium in which the chlorine is present as $Cl-$; with solutions of potassium chlorate or chloracetic acid, where the chlorine ion forms part of complex ions, ClO_3, $C_2H_3ClO_2$, silver nitrate yields no precipitate.

In 1896-7 Paul and Krönig showed experimentally that the antiseptic action of different salts of mercury, of equal molecular concentration, was proportional to the degree of dissociation, i.e., to the number of mercury ions in these solutions.

Further, toxic, caustic, and therapeutic actions are essentially ionic. Certain solvents, alcohol, glycerin, vaseline, fats, dissolve electrolytic substances without dissociating them; such solutions are non-conductors of electricity, and no longer display the toxic and caustic effects of the substances dissolved in water, these effects manifesting themselves progressively only, and slowly according to the rate at which the water of the tissues dissociates the dissolved substances. For instance, carbolic acid when dissolved in glycerin or vaseline has almost no toxic action, and may be applied to dry tissues in powerful concentrations without any irritant or toxic results.

Therapeutic actions are in the great majority ionic; to the practitioner, it is the ion whose arrangement is most important, not that of the atom or the molecule. Let us consider the phosphides and the phosphates; both contain the element phosphorus, but while the one is intensely toxic the other has no poisonous action at all; there is no analogy whatever between their actions on the living organism. If united to indifferent or feeble cations, all the phosphides exercise similar toxic and therapeutic effects; the same similarity is true of the phosphate actions. It is to the phosphorus ion that the phosphides owe their toxic and therapeutic action; the phosphates contain phosphorus in the same proportion as the phosphides, but here it forms part of a complex ion PO_4, whose properties are quite different from that of the phosphorus ion of the phosphides. These remarks apply also to chlorides and chlorates, to iodides and iodates, to sulphides and sulphates, and in general to all ions.

Practitioners apparently have not taken enough notice of these facts in treatment. When a cacodylate or an arylarsenate is given, we are not using an arsenical treatment in which we must look for such effects as those of the arsenides, arsenites, or arsenates—this is sufficiently proved by the difference in the toxic doses of these various preparations; there is a different physiological and therapeutic action belonging to each different ion of which arsenic forms a part. Iron might be administered medicinally in the form of ferro- or ferri-cyanides, for

these contain iron ; nevertheless, they display none of the properties of the iron cation, but those of the complex anion of which the iron forms a part. In the treatment of syphilis many complex combinations of mercury are in use, but the active therapeutic principle in all is the mercury ion ; quite a small group of mercurial preparations, the perchloride and the biniodide, yield a large number of these ions, and it is easy to see that these are by far the most effective combinations.

It is not only by means of the electric current that ionic medication is practised ; the majority of drugs given by the mouth owe their activity to ions. For example, we prescribe solutions of potassium iodide, which contain electrically-neutral molecules KI, electro-positive ions K+ and electro-negative ions I−. It is to these last that all the activity is due, and it is proportional to their concentration.

The same electromotive force applied under similar conditions to different solutions gives currents differing in intensity, i.e., different solutions oppose differing resistances to the movements of the ions. The inverse of the resistance is called the *conductivity* : $C = \frac{I}{R}$. The electrical conductivity of solutions is proportional to : (1) The number of ions per unit of volume ; (2) The charge of the ions ; (3) The rapidity of displacement of the ions.

It is the charge of the ions which determines their chemical valency : a bivalent ion such as that of calcium carries twice the electrical charge borne by a monovalent ion such as that of sodium.

The *specific conduciivity* of an electrolyte is the conductivity of a cubic centimetre of that electrolyte.

The relative speed of ions is measured by the variations in concentration of the electrolytes around the anode and the cathode under the influence of the passage of the current. If an electrolytic cell be separated in two by means of a porous partition, after the decomposition of one or more equivalents, an unequal sharing of the loss is discovered. For copper sulphate, for example, the contents of the negative vessel have borne two-thirds of the loss of concentration, the positive one-third only. Since 1859, Hittorf's ingenious explanation of this phenomenon has been accepted, as follows :—

$SO_4 - - SO_4 - - SO_4 - -$	$SO_4 - - SO_4 - - SO_4 - -$
$Cu^{++} Cu^{++} Cu^{++}$	$Cu^{++} Cu^{++} Cu^{++}$

Fig. 5.—Before passage of current.

In *Fig.* 5 is depicted an electrolytic cell containing sulphate of copper, the vertical line representing the porous partition separating the cell into two equal parts.

$SO_4 - -$	$SO_4 - - SO_4 - - SO_4 - - SO_4$
$Cu^{++} Cu^{++} C^{++}Cu\ Cu^{++}$	$Cu^{++} Cu^{++}$

Fig. 6.—After passage of current.

Fig. 6 represents the cell after the passage of the current, and

postulates a displacement of the acid radicle twice as rapid as that of the cation ; in other words, two acid radicles pass through the partition on their way to the anode, while one copper ion gets through on its way to the cathode. It is seen that three ions are despatched towards each electrode, but that owing to the difference in the speed of the ions, the negative half of the cell contains only one molecule of copper sulphate, and has lost two-thirds of its concentration, while the positive half contains two molecules, and has lost but one-third of its concentration.

The ions move, then, in opposite directions with varying speed, and it is seen that the losses of concentration n at the cathode, $1-n$ at the anode, bear the following relation to the speed u of the anions, and v of the cations :—

$$\frac{n}{1-n} = \frac{u}{v}$$

The means of discovering the relative rapidity of ionic movements is therefore to be found in the fall in concentration.

Conductivity in electrolytes is proportional to the sum of the speeds of the anion and of the cation, as Kolrausch showed in 1876.

The fluids of the human body are conductors of electricity ; the body itself is an electrolyte, the current passing through it consisting solely of the double motion of the ions, anions towards the anode, cations towards the cathode.

It is easy to see that at the points of entry and exit of the current an exchange of ions occurs. At the anode the body loses its anions and receives cations from the electrode, while at the cathode it receives anions and gives up cations.

The human body may be regarded as a solution of sodium chloride. A current entering and leaving through a solution of potassium iodide will have the effect shown in *Figs.* 7, 8.

K^+ K^+	Na^+ Na^+ Na^+ Na^+	K^+ K^+
I^- I^-	Cl^- Cl^- Cl^- Cl^-	I^- I^-

Fig. 7—Before passage of current.

+	K^+	K^+ Na^+ Na^+ Na^+	Na^+ K K	−
	I I Cl^-	Cl^- Cl^- Cl^- I^-	I^-	

Fig. 8.—After passage of current.

The passage of the current displaces cations towards the cathode, anions towards the anode, and it is seen that after its passage an ion Cl^- has left and one K^+ has entered the body at the anode, while at the cathode an ion Na^+ has left the body while one I^- has entered it.

The movement of ions takes place in the body over the whole path of the current, and in consequence the same ionic exchanges occur over the whole surface, separating fluids of different chemical composition.

Sometimes a " simple current " is spoken of, in contradistinction to

the ionic effects of the electric current ; but there is no such thing as a " simple " current, i.e., one without ionic action. The electric current passing through the human body is no other than a double stream of ions, and its effects are therefore of necessity ionic.

It is easy to observe experimentally the penetration of ions into the body under the influence of an electric current. To each of two rabbits (*Fig.* 9) an electrode of sodium chloride and one consisting of a solution of sulphate of strychnine are attached ; the two strychnine electrodes are joined together by a conductor ; one of the sodium chloride electrodes is connected with the positive and the other with the negative pole of the battery. The current is passed, entering one rabbit through sodium chloride and leaving through strychnine sulphate, entering the second animal through the strychnine and leaving through the sodium salt. The strychnine, a cation which goes *down* the current, enters the second rabbit, which shortly dies in tetaniform convulsions ; while the other, to which the strychnine serves as cathode, is unhurt.

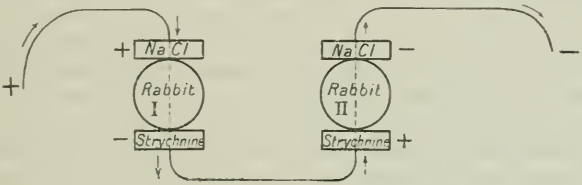

Fig. 9.

Ionic introduction may be readily observed by the use of coloured ions ; under a cathode of potassium permanganate the permanganic ion MnO_4 is introduced into glands, where it is reduced to the black insoluble dioxide, so that after the current has passed, all the cutaneous glands are full of black dioxide of manganese.

In the same way the caustic effects special to each ion render the study of ionic penetration possible. The manganese compounds show strikingly the whole importance of ionic classification. If the current be passed in through an anode consisting of a solution of manganese chloride, leaving through a cathode of permanganate, the ion $Mn++$ enters the body at the anode and the permanganic ion MnO_4-- at the cathode. There is no difficulty in seeing the enormous difference between the action of the two ions, both of which, nevertheless, introduce manganese.

Apparatus for Clinical Use.

To apply ionic medication, a constant-current battery, a switch-board for regulating the current, measuring apparatus, conductors, and electrodes are needed.

There are various *constant-current batteries* ; the best, those which give the most regular current, a matter of capital importance in treatment, are accumulators and piles. Fifty to sixty volts must be available, i.e., twenty-five to thirty accumulators. These must be large

enough to yield a sufficiently constant current, and to avoid the necessity for frequent re-charging. When ready means for recharging accumulators are not at hand, piles must be used instead. Nowadays depolarization piles are made, of manganese dioxide ; these, when large enough, do very well for medical use. The small, so-called medical, portable piles, are unsuitable ; their resistance is too great to allow of an adequate intensity being attained, they become polarized or exhausted very quickly, and do not possess the constancy that is desirable. The constant current of town installations may be used, or that of a dynamo driven by the town current ; but these supplies have this grave drawback, that they are not constant or regular enough, so that in application to the head or face they may cause pain or accidents such as giddiness or syncope.

The current may be regulated by three types of apparatus : *collectors*, by which the accumulators or piles may be brought into or out of the circuit one by one ; *rheostats* or variable resistances, which can be progressively and regularly cut down from a high maximum ; finally, *reducers of potential*, high resistances introduced between the two poles of the battery, along which the potential diminishes gradually from the positive to the negative pole, the current being passed through this resistance between two contacts, which may be separated, and the resistance thus increased by means of a movable key.

One measuring apparatus, and only one, is absolutely necessary, a *milliampère-meter*, by means of which the intensity of the current may be known and controlled at any given moment. It must be aperiodic, i.e., free from oscillations.

The milliampère-meter and the watch are the instruments of ionic dosage. It is certainly possible to measure the ions introduced in terms of weight, but this method of dosage is quite impracticable, by reason of the knowledge which it necessarily involves of the relative speed of the ions taking part in the current. Moreover, a knowledge of the intensity of the current, the time of application, and (in local actions) the area of the electrodes, yields sufficient accuracy to guide the practitioner and to make repetition of previously-obtaining conditions possible.

It should be realized that the proportion of ions introduced is quite independent of the concentration of the solutions used ; it depends on nothing beyond the intensity of current and the duration of application. Solutions should be concentrated enough to yield the necessary ions, and to avoid the " parasitic ions " coming from metal plates ; but the use of over-strong solutions is inconvenient on account of their possible irritant action and their bad distribution of current. The fluids of the electrodes ought to be approximately of the same conductivity as the skin.

The *conductors or wires* used to connect the patient with the battery should be flexible, sufficiently long, and firmly fixed—on the one hand to the battery, on the other to the metal plate of the electrode ; for this latter the best form of attachment is a good solder, applied as much

to the wires as to the plates. If the wires are not properly fixed, or in poor condition, broken at one point, sudden variations in the intensity of the current will occur, causing shocks and pains which frighten the patient and interfere with the treatment.

The *electrodes* are a very important consideration. They should consist of a plate of flexible metal, varying in size with the particular application to be made; sheets of tin 1 mm. thick do very well. The surface to be applied should be covered with clean, thick, absorbent material, soaked with the solution to be used; and the metal plate may be carefully bandaged down upon this material. If absorbent cotton be used, it must be thrown away after each sitting; but if absorbent tissue be employed, it can be used several times if washed carefully each time and soaked in distilled water, so as to remove all traces of the solution used, and the ions set free from the body or from the electrode. If, for instance, material which still contained sodium chloride were used for the introduction of the iodine ion by impregnation with potassium iodide, the ion introduced would be not iodine but merely chlorine.

These new electrodes constitute the greatest step forward in the technique of applications of constant currents; by their use alone is ionic treatment possible, and if they are applied as described, an intensity much greater than was tolerable heretofore may be attained.

The old electrodes, rigid metal plates covered permanently with chamois leather, and used on patient after patient, should be absolutely discarded, since they are so unsuitable as to make any ionic treatment quite impossible. Moreover, they are too rigid to be moulded to the parts, so that they rest only upon certain points at which the current is concentrated, and thus constitute a fruitful source of burns and ulcers following intense and prolonged application of currents.

The intensity which can be borne per square centimetre of electrode does not increase in direct proportion to its surface; an electrode ten times larger than another does not make a tenfold intensity bearable: far from it. I have found the cause of this fact in the unequal distribution of the current beneath the electrode; it is much denser and stronger at the margin than in the centre of the electrode. This inequality may be diminished by avoiding the use of too readily conducting electrodes; the saturated material should be judiciously squeezed before application.

Baths are, in general, bad electrodes; the current, and therefore the ions, only enter and leave the body at the line at which the body intersects the surface of the fluid, so that the part immersed is quite withdrawn from the action of the current.

Therapeutic Application.

The effects produced by ions introduced by the electrical current may be *general* or *local*.

Many ions may be introduced electrically in quantities large enough to produce marked effects; it is easy to kill animals by introducing the strychnine cation or the anion of potassium cyanide. On the other

hand, the general absorption and excretion of ions can be readily observed. With a large cathode of potassium iodide solution, the patient spitting on starched paper to which a drop of nitric acid is applied, the blue colour of starch iodide is seen to appear on the paper a short time after the establishment of the current ; and iodine may be as readily demonstrated in the urine by shaking it up with chloroform. Finally, drugs such as morphine, strychnine, and the other alkaloids may be readily introduced into the human body in therapeutic doses by means of the electric current. However, this is complicated and laborious, and the gastric and subcutaneous methods of introduction are always preferable ; and it is only in special cases, where the usual methods are not available, that the electric current should be used to produce general ionic action.

The particular sphere of usefulness of the electrolytic introduction of drugs is that of *local medication* ; especially as regards substances which do not penetrate into the general circulation, the base metals, such as zinc, which coagulate the albuminous substances of the body. By the use of this method active substances can be brought into action on the tissues with a concentration which would be fatal if applied to the whole organism, and it renders possible the impregnation of the tissues with substances which can be used by no other method, since ions travel through coagulated albumin.

When a solution of sodium chloride is used as a cathode, the chlorine ion is introduced into the tissues, cations leaving the body and penetrating into the electrode. The chlorine ion, electrolytically introduced, exercises a favourable stimulant effect upon the tissues of the region ; in **Alterations of Nutrition** and **Atrophy** caused by previous inflammation, the chlorine ion definitely accelerates return to the normal state. It is pre-eminently in states of **Post-inflammatory Ankylosis** that these results are clearly seen. In one case a lady was brought to me, who two years previously had been treated for phlebitis of all four limbs by six months' absolute rest. Since that time all her joints, including those of the fingers, had remained absolutely ankylosed ; she could neither close her fist nor raise her hands to her mouth, so that she had to be fed, and her condition showed no improvement. Electrolytic treatment was begun, two or three joints for thirty minutes daily. From the beginning a progressive improvement was noted, movement returned and increased steadily in amplitude, and when treatment was discontinued after three months, all the movements were restored. A year later the patient was free from all stiffness, and no trace remained of her long and painful illness. In a very large number of cases of ankylosis and sclerosis to which I have applied this treatment, the results have been as a rule favourable, often remarkably so.

The treatment is applied by means of pieces of absorbent tissue soaked in a warm solution of sodium chloride and lightly squeezed, folded in long bands four layers thick, or bandaged round the joint three or four times to give a close adaptation, or wrapped round the joint eight to sixteen layers thick. The electrode, a flexible metal

plate, is applied upon the absorbent tissue and fastened on by a bandage. The other "indifferent" electrode, similar in nature, is applied to different parts at different sittings, so as to change the direction of the current in the joint under treatment. By this means currents of 100 to 200 milliampères may be readily tolerated when applied to the knee, and without burns occurring. The less the diseased joint is covered by soft parts, the more accessible it is to the electrical current, and the more marked are the results. The treatment is much more effective for the hand, wrist, and knee, than for the hip or shoulder, where the current and the ions are taken up immediately by conductile vascular tissues.

Iodine has a similar sclerolytic action, perhaps even greater than that of chlorine; but the iodine ion is much less readily borne by the skin, and the necessary reduction of intensity deprives it of its superiority.

In cases where improvement is unduly slow, this introduction of the iodine ion may with advantage be interpolated between every two or three chlorine ionizations.

When time is no great object, two or three applications are made per week; but if time presses, the sittings may be given daily, the position of the electrodes and the direction of the current being changed each time.

There are many ions giving this wholesome stimulus to nutrition, and thus assisting in the cure of chronic inflammations and early sclerosis, and restoring the tissues to a normal state. Particularly is this true of the ion OH, which penetrates into the body from beneath a metallic cathode in contact with which it is formed by secondary actions. Consider, for example, the sodium ions Na + of the living body, passing over to a metal cathode in contact with the tissues. Their positive charge is neutralized by meeting with the negative cathode, and they become the neutral element Na. This neutral element, however, attacking water, the following reaction occurs: Na + H O = NaOH + H. Hydrogen is set free, the soda is dissolved in the organic fluids, forming the ions Na + and OH –, and the latter passing towards the anode penetrates into the tissues. This is what happens, for instance, in urethral electrolysis by a metal cathode. Moderate electrolysis, repeated twice a week, with a metal bougie is an excellent treatment for **Urethral Stricture**; the ion OH tends to resolve and to soften scar tissue and thus to the disappearance of the stricture.

The same treatment may be applied to all **Stenoses** and to **Cicatricial Changes** generally.

Gout may be treated with advantage by the electrolytic introduction of the lithium ion under an anode of lithium chloride; the current is doubly useful in this case, for it drives in lithium and removes the uric acid ion, which is to be found in the electrode.

The electrolytic introduction of the salicylic ion from a cathode of sodium salicylate solution is a valuable mode of treating all **Painful**

Affections. Salicylic acid is excreted in the urine and the local pains are quickly relieved. Salicylic ionization is particularly valuable in **Trigeminal Neuralgia :** severe and chronic cases, resisting all other methods, may be completely cured by the introduction of the salicylic ion from a cathode consisting of a thick pad of absorbent tissue soaked in a warm two per cent solution of sodium salicylate, and applied over the painful area. The intensity should be raised gradually as high as the patient can bear it ; 40 milliampères may be reached or even passed. Sittings should last thirty to forty-five minutes, three times a week. Cure is the rule ; in some cases it is very speedy ; in others it may need twenty sittings. Salicylic ionization is a useful treatment of all **Superficial Neuralgias.**

Infected, inflamed, and painful **Wounds** may also be treated by salicylic ionization. They are covered with a thick dressing of absorbent cotton soaked in sterilized sodium salicylate solution, the current is passed, and after the sitting, pain, though constant and severe, will have quite disappeared. If the dressing be allowed to remain in position till the next sitting, a rapid sterilization and healing of the wound will be seen.

The study of the therapeutic effects of ions is yet in its infancy ; but already constant and marked results of a really specific nature have come to light.

Lewis Jones, of London, has reported that **Warts** disappear after one or two applications of the magnesium ion, an observation confirmed by all who have tried it.

The zinc ion, introduced by means of a zinc needle inserted into the diseased area and acting as an anode, will abort **Boils** and **Anthrax** in twenty-four to forty-eight hours, instead of the long and painful course and free incision formerly necessary. The zinc ion is the best coagulant of albumin and, penetrating into diseased tissues, not merely fails to open but actually closes vessels, thus averting the metastases and generalizations of infection which are apt to follow open operations. **Wounds, Tuberculous Fistulæ,** and **Abscesses,** treated by an anode of absorbent cotton soaked in a solution of chloride or sulphate of zinc and applied to the whole area of disease, are quickly cured without metastatic complications. The action of the zinc ion is purely local, and in nearly all regions the dose may be pushed with impunity.

Fine zinc needles or threads soaked in a solution of a zinc salt and passed through the tissues with a needle, used as an anode, yield infallible results in the treatment of **Nævi.**

Epitheliomata, and especially those which resist the *x*-rays, are curable by zinc ionization.

When it is desirable to limit the surface of introduction exactly, a hole is cut in a piece of oiled silk to define this surface, and material soaked in the zinc salt is applied over the silk.

Zinc ionization by means of a suitable bougie in moderate doses is a very effective method of cure for **Gleet,** by sterilizing the urethral glands.

Betton Massey, of Philadelphia, has treated **Tumours of the Breast** with zinc ions. Under general anæsthesia zinc needles are passed beneath the bases of the tumour, the cathode being placed on its summit, and very intense currents may be passed.

Fibroids and **Endometritis** may be advantageously treated by zinc ionization from a zinc hysterometer used as the anode ; careful applications are absolutely effective in suppressing metrorrhagia.

Obviously radio-active ions, such as those of uranium, thorium, or radium, may be introduced by electrolysis. Since 1900 I have often introduced the thorium ion as a treatment for **Tumours** with satisfactory results, cure in some cases, sensible improvement in all.

It is impossible within the limits of this article to review all the conditions susceptible of treatment by ionic medication. Those who wish for further information as to the laws governing solutions, ions, and their use in medicine, will find them in my two works : " Mechanism of Life " and " The Electric Ions and Their Use in Medicine " (Rebman Ltd. London).

Part II.—The Dictionary of Treatment.

A REVIEW OF MEDICAL AND SURGICAL PROGRESS FOR 1911, BY MANY CONTRIBUTORS.

Together with a brief Synopsis of Treatment recommended during recent years.

GENERAL REVIEW.

ABDOMINAL SURGERY.—This section is concerned with a number of interesting matters; the surgical affections of the abdominal wall, too apt to be regarded merely as the obstacle which the surgeon has to traverse in his attack upon the viscera behind it, are considered at length, and there are new facts with regard to pancreatic and intestinal surgery, such as those relating to diverticulitis and Link's successful case of pancreatostomy. In the paragraph on stomach surgery, special attention is directed to the jejunal ulceration which occasionally follows the operation of gastro-enterostomy.—[ED. *M.A.*].

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CANCER.—The parasitic (extrinsic parasitic) theory of the origin of cancer is perishing for want of evidence. On the other hand the intrinsic parasitic theory, which regards the cancer cell itself as a parasite arising *de novo* from the normal cells of the body, is at present dominant. Bond, of Leicester, has stated this theory in biological terms, and Butlin has claimed for the cancer cell a separate zoological nomenclature.

The experimental study of living cancer cells under the microscope by the method devised by Carrel and Burrows in America, seems to open up an extensive and promising field of work. This is the most striking new departure in cancer research, but it has not reached the fruitful stage. In this country H. C. Ross claims to have induced cell-division in human leucocytes and in an epithelial cell by the action of certain chemical substances. Upon these observations he has based an interesting theory of the origin of cancer.

In the field of diagnosis the most interesting work is that of Beckton on Altmann's granules, in the Middlesex Hospital Cancer Research Laboratories, and of Miss Elsie Royle on the urine in cancer.

In the therapeutic field there is unfortunately nothing of importance to record. The writer is glad to believe that the general acceptance of the permeation theory of dissemination is improving the methods and results of operation for cancer of the breast and of some other organs, and for melanotic sarcoma—[W. S. H.]

Diseases of Children.—In the department of infant feeding, one of the most recent innovations is the use of so-called "Eiweiss milch," as suggested by Finkelstein, which consists essentially in the use of broken-up curd which has been washed free of the whey and then mixed with boiled buttermilk and some form of malt sugar. Brilliant results are attributed by the author to this method of feeding.

The use of separated milk albumin in a soluble form has had extensive trial in the past year, and some have found good results from it.

Congenital hypertrophy of the pylorus continues to attract attention, and the question of medical *versus* surgical treatment remains *sub judice*; whilst the number of cases treated successfully by operation is increasing rapidly, the doubt remains whether operation is often justifiable.

The value of chloretone in chorea has been emphasized by various writers. Some, however, have thought that it aggravates certain symptoms of the disease.

In the treatment of cyclic vomiting, glucose has been shown to have a value resting upon chemical grounds as well as upon clinical experience.

In the feeding of children with infantile diarrhœa, banana flour has recently been advocated. Much attention has been drawn to the value of subcutaneous infusion in infantile diarrhœa by the prominence given recently to sea-water injections.—[G. F. S.]

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Circulatory Diseases.—The year's work shows several advances of practical importance. We are arriving at a fuller understanding of the meaning of heightened arterial tension, and are therefore better able to distinguish those cases in which an attempt should be made to reduce it.

Similarly, the direct causation of the various types of cardiac arrhythmia is being painfully but steadily elucidated. The facts discovered will have wide prognostic and therapeutic importance in the near future.

Finally, a vast amount of recent research into the action and uses of digitalis and the other "cardiac tonics" is on record: this cannot fail to place the practitioner in a sounder position than he has hitherto enjoyed, in his attack on cardiac disease.—[C. C.].

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Dermatology.—No very striking therapeutic innovations are to be recorded in this section.

Vaccine therapy has been advancing steadily, and has been applied empirically, especially in the United States, and with apparent success, to a number of diseases not usually regarded as of microbic origin.

The use of freezing by means of carbon dioxide snow has been much extended, and this treatment is rapidly superseding all others in removing superficial nævi. I regard it as the method of election in early rodent ulcer.

The identification by Sabouraud of a new parasitic organism closely resembling trichophyton, and called by him *Epidermophyton inguinale*, was noted in the last edition of the *Medical Annual*. Several examples of its occurrence in Great Britain are now on record, and from a discussion on the subject at a special meeting of the Dermatological Section of the Royal Society of Medicine, it would appear to be fairly widespread. The condition which it causes is usually mistaken for chronic vesicular eczema of the fingers and toes.

Two if not three cases of sporotrichosis have been reported as occurring in Great Britain, and constitute the first recognition of this disease by British observers. The article on this subject will indicate how easy it is to confuse this condition with syphilis and tuberculosis, and how important is its identification.—[E. G. L.].

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Gynæcology and Obstetrics.—The modern radical operation for carcinoma of the cervix continues to gain ground. Papers on myomectomy and the various methods of shortening the round ligaments have appeared, which repay perusal, and the treatment of some of the obscurer forms of pelvic pain has received attention. A new disease of the vagina, "Adenomatosis vaginæ," has been described, which, together with an exhaustive paper on malignant disease of that canal, will be found epitomized.

Turning to obstetrics, a summary will be found of a remarkably painstaking contribution on Cæsarean section. The place of this operation in the treatment of eclampsia and placenta prævia has also been made the subject of consideration. Finally, the practice of pubiotomy, which seems to be gaining ground in certain quarters, is justified by the results that are reported therefrom.—[V. B.]

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Acute Infectious Diseases.—There has been no outstanding work in connection with these diseases during the past year. The treatment of typhoid fever by typhoid vaccine has been tried to a considerable extent, especially in the United States, but the results are not remarkably favourable. The evidence in favour of the value of the prophylactic use of the vaccine is becoming stronger. It has been submitted to a searching criticism by Firth, and has not broken down under it. A second inoculation is in future to be practised in the case of our troops in India when they have been in the country two years and a half.

A good deal of work has been done towards the elucidation of the two forms of paratyphoid fever. From the accounts given under this heading it seems possible that a new disease may have been discovered in South Africa, unless it turns out to be a variety of typhus, as Brill's disease would appear to be.

Certain experiments on the seat of the infectious agent of measles have been carried out by Goldberger and Anderson, but the actual cause of the disease still baffles the investigator.—[E. W. G.]

General Medicine and Digestive Diseases.—The subjects to which special attention is directed in the present issue are arthritis deformans, peptic ulcer of the stomach and duodenum, exophthalmic goitre, familial jaundice, and the various "functional" forms of dyspepsia. In the first three, particular reference is made to the newest methods of treatment; and it seems as if the forlorn hope led against these strongholds of disease by the investigating physician might yet achieve a victory.—[Ed. *M.A.*]

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Mental Diseases.—Among the subjects calling for special notice in this volume may be mentioned those of alcoholism and narcomania. The article on these disorders contains some account of the increase of the heroin habit and the means of combating it.

The psycho-analytic methods of Freud are dispassionately discussed, the dangers and drawbacks being balanced against the advantages. There is also a full account of the part played by heredity in the causation of insanity.—[Ed. *M.A.*]

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Nervous Diseases.—The condition of pseudo-meningitis or meningism continues to attract attention, and its differential diagnosis is discussed. A considerable amount of new work has been done on the subject of influenzal meningitis, whilst attention is directed to the symptomatology of affections such as sciatica and phrenic neuralgia. The treatment of delirium tremens, epilepsy, paralysis agitans, seasickness, and tetanus is also described.—[P. S.].

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Ophthalmology.—There is advance in two directions: on the one hand towards a more complete solution of the problems peculiar to the study of the eye, and on the other to the establishment of a closer connection with other branches of medicine and surgery. In illustration of this, we may point, on the one hand, to the number of excellent new text-books dealing with errors of refraction and anomalies of the ocular muscles, to recent advances in the treatment of glaucoma, and to the controversy respecting the intracapsular method of cataract extraction. On the other hand, we may point to the growing employment of such remedies as tuberculin and salvarsan in ophthalmic clinics, to the proved connection between irido-cyclitis and septic absorption from decayed teeth, from the alimentary canal, or from the uterus, and to the close connection which is now established between optic neuritis and cerebral surgery.—[A. H. T.]

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Pulmonary Diseases.—Among other articles on diseases of the lungs will be found an account of the symptoms of acute pulmonary œdema, mention being made of the striking efficacy of morphia in the relief of this urgent condition.

The necessity of regular estimations of the blood-pressure during the course of an attack of acute pneumonia is insisted on, and their importance as a guide to the timely treatment of impending cardiac failure. A full account of the most approved recent methods of meeting this complication, and of the treatment of the disease in general, will be found.

Under tuberculosis a full résumé of the methods of specific diagnosis, with their limitations, is given. As regards treatment, attention is specially drawn to the procedure, as yet but little known in this country, of the production of an artificial pneumothorax by the injection of nitrogen into the pleura, and its striking effects on the course of the disease and the control of hæmoptysis. The advantages of continuous inhalation and of the use of raw meat juice are discussed. The physical signs and symptoms which may lead to the recognition of tuberculosis of the bronchial glands in childhood are also mentioned. —[J. J. P.].

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Renal and Urinary Diseases.—Much of the recent work on nephritis has been from the purely experimental standpoint, and so far is not applicable to therapeutics. Widal discusses the concentration of the blood in nephritis, but the method, though of interest, seems to have but a limited application in clinical work. An important discussion on functional albuminuria was introduced by Goodhart at the Royal Society of Medicine, and numerous speakers took part, the consensus of opinion being in favour of a good prognosis in those cases. Several communications are on the use of tuberculin in renal tuberculosis, and definite indications for its use are laid down by Cabot.

A very complete abstract is given of Graham Little's paper on the estimation of the Joulie reaction of the urine. Very little notice has, so far, been taken of Joulie's work in English publications. It is claimed that the reaction will give very definite indications for treatment.

Dana presents an important contribution to the etiology of hæmatoporphyrinuria, pointing to its origin in perverted hepatic metabolism rather than in hæmolysis. A new method for the estimation of uric acid is given, and attention has been devoted to oxaluria.

The Cartwright Lectures of the Columbia University are devoted to the chemical problems of diabetes. They are too technical for abstract in the *Annual*, but those interested will find an account of this most important subject in the *Medical Record* (1910, ii., 889 *et seq.*). A valuable and practical communication, by Magnus Levy, is on acidosis. In the treatment of diabetes the soy bean and the oatmeal treatment continues to attract attention, and seems to give valuable results. Crofton continues observations on the use of extract of pancreas which can now be obtained under the trade name of "Hormonadin," and which he has found valuable.

An interesting preliminary communication on the influence of creatin and creatinin on sugar excretion points to the deleterious effects which animal soups and extracts may exert when freely used as food articles for diabetics.—[F. D. B.].

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General Surgery.—To condense an account of general surgical advance into a few lines is impossible. Old subjects are discussed from new standpoints, as in the case of fractures and tuberculous disease of joints; while on the other hand the surgeon is turning his attention to new fields for his activity, notably in affections of the thorax and of the blood-vessels. A paper of practical interest is that dealing with elastic traction.—[Ed. *M.A.*]

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Tropical Diseases.—The advances which each year brings in this section of medicine are remarkable and gratifying in respect both of their extent and of their variety. The treatment of cholera by hypertonic saline infusions, the attack upon dysentery of both forms, and the apparent possibility of influencing the lesions of leprosy favourably by specific treatment, are the principal features of this hopeful chapter. Substantial advance in the knowledge of etiology, such as must always precede sound therapeutic discoveries, is also chronicled in respect of beri-beri, plague, and trypanosomiasis.—[Ed. *M.A.*]

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Urinary Surgery.—An addition has been made to the drugs by which the renal function is estimated by the introduction of phenol-sulphone-phthalein by Young, Rowntree, and Geraghty. It is claimed that the drug is superior to any of those previously used for this purpose, but more extended observation is required to test this statement.

The early diagnosis of hydronephrosis with the view of saving the renal tissue before the destruction is far advanced is the object of several methods recently introduced, such as measuring the capacity of the pelvis by ureteric catheter, pyelography, exact measurement of the shadow thrown by the kidney (proportional renal mensuration). Israel claims that there is a specific fever in 8·2 per cent of cases of renal growth. Hæmatogenous suppurative pyelonephritis has been the subject of a number of articles, and its position as a disease distinct from ascending pyelonephritis is firmly established. The association of aberrant renal vessels with hydronephrosis is a subject of recurring interest, and is discussed in two articles. Congenital malformations of the ureter and stone in the ureter are discussed in several articles, but without producing any new facts. There is a tendency to recommend the removal of the ureter at the same time as the kidney in all cases of nephrectomy where suppuration is present.

Thomson Walker has described a group of cases, hitherto unrecognized, in which there is atony of the bladder, without obstruction or signs of nervous disease.

In another article this observer advocates the systematic and thorough treatment by operation, of papilloma of the bladder. Binney discusses at length and advocates intravesical operations for tumours of the bladder.

Perineal prostatectomy is advocated in preference to the suprapubic operation by a number of American surgeons.

Groves recommends the wider use of excision of stricture of the urethra in place of urethrotomy and dilatation.—[J. W. T. W.]

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Venereal Diseases.—The principal subject of discussion has been the therapeutic position of dioxydiamidoarsenobenzol ("606"), now patented and sold under the name of Salvarsan. It may be stated, shortly, that this drug has not fulfilled all its original expectations. These were that one or more injections of the drug would destroy all the spirochætes in the body without injuring the patient, and that in this way syphilis might be cured without prolonged mercurial treatment. There is no evidence that all the spirochætes have been destroyed, nor that syphilis has been permanently cured by salvarsan; on the other hand, there is considerable evidence of its toxic effects on the patient. Relapses after injection of salvarsan are common, and it is now recommended to give prolonged mercurial treatment in addition. This being the case, it may be asked what advantage this drug possesses over the older preparations of arsenic, such as Donovan's solution, which has been long regarded as a useful auxiliary drug in the treatment of syphilis. The upholders of salvarsan reply that it has a more rapid action than mercury, and is therefore useful in cutting short the contagious period of syphilis in the early stages; that it heals lesions which are resistant to mercury; and that it is especially beneficial in cases of malignant syphilis. That salvarsan has a rapid healing effect on certain syphilitic lesions, chiefly of the ulcerative type, is established, but whether this action is more rapid than that of older methods is not yet settled. As regards malignant syphilis and cases refractory to mercury, it is astonishing what a number of such cases were reported after the introduction of salvarsan. As a matter of fact, malignant syphilis is nowadays rare, and cases resistant to mercury still rarer. It is probable that many of the cases reported would have yielded to judicious treatment by mercury and iodides.

In the present state of our knowledge, therefore, mercury still holds its place as the principal drug in the treatment of syphilis. Salvarsan is only an auxiliary medicament. Some authorities recommend it only in exceptional cases; others prefer hectine, another organic preparation of arsenic, which is certainly less toxic and is said to be equally efficacious; others, again, prefer the older arsenical compounds, such as Donovan's solution; while some report good results from cacodylate of sodium.—[C. F. M.]

ABDOMINAL SECTION, SEQUELÆ OF.

John B. Deaver, M.D.
D. B. Pfeiffer, M.D. } *Philadelphia.*

Acute Dilatation of the Stomach.—Cases are reported by Carmichael[1] and by Lee.[2] To the reviewers it seems incomprehensible that patients should perish from primary dilatation of the stomach. In an experience, now embracing many thousand laparotomies by one of us, it has never occurred as a fatal complication. This we attribute to the early and repeated use of the **Stomach Tube** in persistent post-operative nausea and vomiting.

In Carmichael's first case the tube was not used at all ; in the second, only after a week of persistent vomiting ; and in the third, not before three days of vomiting. In the last case " a stomach tube was passed, and one and three-quarter pints of bilious straw-coloured fluid recovered. The sickness ceased immediately, although she had vomited continuously for three days previously." The first and third cases recovered. The second died after gastrostomy to empty the overfilled stomach, though the relief afforded by the stomach tube earlier in the day was so great that it is difficult to see why it was not used again. Lee's cases are not reported in sufficient detail to determine how early or how often the stomach tube was used. Both authors laud the tube in discussing treatment. Lee discusses the use of **Morphia, Strychnia,** and **Eserine.** Gastrostomy and gastro-enterostomy are also considered.

[To us it seems that this complication has been enveloped in too much mystery. There is nothing more common than the accumulation of fluid in the stomach after operation. The secretions from the liver and pancreas are large in amount. Irritation of the intestinal mucosa may swell the excretion of fluid into the bowel. Antiperistalsis is frequent after operations. Now for the stomach to become filled and distended it is only necessary for the reflex of vomiting to be disturbed or absent, or for the cardiac orifice to maintain a spastic condition. Once over-distended, the contractile power of the stomach is impaired, and kinks are set up which further obstruct the onward passage of fluid or gas. The stomach is passive, and if kept empty will give no symptoms of itself. In our experience, the onset of dilatation is always heralded by nausea, vomiting, or by the spitting of small amounts of regurgitated fluid without either nausea or vomiting. It is at this stage that the stomach tube is *always* curative of acute dilatation, and the surgeon who uses it early and repeatedly will have no fatal cases to report. It is frequently a matter of surprise to the uninitiated to observe how much fluid is present in the stomach when the symptoms of its presence in the form of nausea or regurgitations are so slight and apparently trivial.—J. B. D., D. B. P.].

Active Lobar Collapse of the Lung.—Two suggestive contributions to the pathology and clinical aspect of post-operative lung complications are made by Pasteur.[3] According to him, symptoms of slight or marked severity may be due to collapse of a portion of the lung tissue. This is usually basal and unilateral, but at times bilateral ;

it is due chiefly to failure of the action of the diaphragm. This failure occurs as a result of paralysis, or, more often, after operations, as a sequel of reflex stoppage of the respiratory excursions. The symptoms may be acute, resembling those of pulmonary embolism or pneumonia. There is shock, dyspnœa, cyanosis, a rise in temperature, and pain, which is not, however, of the sharp pleuritic character. Cough and slight mucoid or mucopurulent expectoration are present. The lung on the affected side is dull to percussion, and on auscultation blowing breathing and perhaps mucous râles are heard. The most distinctive sign is displacement of the heart towards the affected side. Pasteur thinks that death may ensue, but usually recovery is speedy, more rapid in fact than in either embolism or pneumonia. It may be present without symptoms, being discoverable only by signs. In its collapsed state, the lung is probably more liable to infection, and this condition may be largely responsible for the localization of post-operative broncho-pneumonia.

REFERENCES.—[1]*Edin. Med. Jour.* 1911, May; [2]*Bost. Med. and Surg. Jour.* 1911, Ap. 20; [3]*Lancet*, 1910, Oct. 8, and 1911, May 20.

ABDOMINAL WALL, SURGERY OF. (*See also* HERNIA.)

John B. Deaver, M.D.
D. B. Pfeiffer, M.D. } *Philadelphia.*

Desmoid Tumours.—Under this convenient name, signifying tumours derived from, or having the characteristics of, tendinous or ligamentary structures, are grouped the connective tissue tumours of the anterior and lateral abdominal wall (sarcoma, fibroma, myoma, fibromyoma). Their incidence is roughly estimated by Lockwood[1] as ½ per cent of abdominal tumours, omitting ruptures. Recently there have been reports of seven cases by Morison and Drummond,[2] and an equal number by Lockwood. Six of the seven in each series occurred in women. This fact strongly suggests the influence of the marked alterations to which the abdominal walls of women are subject in pregnancy.

The tumours arise from the aponeurosis or intermuscular fascia of the abdominal wall, and may be either benign (fibroma, fibromyoma, certain myomata) or malignant (sarcoma). The former group are encapsulated, may be enucleated, and do not recur. The sarcomata are usually spindle-celled, sometimes round-celled, and infiltrate and metastasize in characteristic manner. They grow along the line of least resistance, i.e., the course of the muscle involved or the planes of confining fascia. This renders the ideal operation one which would remove the muscle and adjacent parts affected in their entirety. Owing to the impossibility of leaving a large defect in the abdominal parietes, this is usually impossible, and the surgeon must compromise, with as wide an excision along the general lines of spread as is compatible with restoration of the abdominal wall.

Ordinarily the tumours have been present for a long time, are painless and not tender. They are usually small or of moderate size. When in the rectus, their site of predilection, their long axis runs in the

direction of that muscle, and when in the flat muscles they tend to form sausage-shaped tumours which lie obliquely or transversely. It is at times difficult to distinguish them from intra-abdominal masses. They have been mistaken for an enlarged gall-bladder, uterine or ovarian tumour, appendicular mass, carcinoma of the bowel, etc., according to their situation. A simple test is to subject the muscle to tension, which will cause the mass to disappear if it lies beneath the muscle, while it may still be felt if it forms a part of the wall. Even this test will occasionally fail when the tumour lies deeply in the wall. Sources of error are gumma, intermuscular abscess, and cyst, instances of the latter condition being reported by Lockwood.

The *serious character* of these tumours may be inferred from the outcome in the seven cases of Morison and Drummond, two of whom are dead from the disease, one untraced, and four well. In Lockwood's cases four were untraced, of which, in two instances, the microscopical diagnosis warranted the belief that the growth was innocent. One case was reported well after a sufficient interval. In two cases the patients, though still living, had been subjected to multiple operations for the removal of metastases.

Surgical Diseases of the Umbilicus.—Cullen[3] has divided these into conditions due to partial or total lack of closure of the omphalo-mesenteric duct, and primary and secondary cancer of the umbilicus.

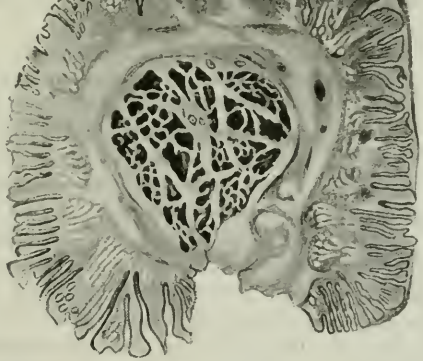


Fig. 10.—The specimen represents a transverse section through a so-called adenoma of the umbilicus. The central stem is made up of non-striped muscle fibres cut transversely. Surrounding this is a zone of fibrous tissue, and the outer surface is covered by a mucosa consisting essentially of glands of the small intestine. (Lannelongue and Frémont, *Arch. Gén. Méd.*, 1884, cliii. 62.)

Non-malignant Abnormalities.—

1. *Adenoma of the Umbilicus.*—This term, which is really a misnomer, is applied to a small, red pedunculated nodule occasionally found springing from the umbilical depression after the cord comes away. It is formed from the outermost portion of the omphalomesenteric duct, which becomes everted as the umbilicus is gradually closing in.

It is composed, therefore, of the usual elements of the intestinal wall, the glands of which give rise to the name (*Fig.* 10).

2. *Funnel-shaped Umbilicus.*—Sometimes, after the cord comes away, the nurse notices that the umbilicus is somewhat moist, and on investigation the umbilical depression is found to be deeper than usual. The outer portion is covered with normal skin, the deeper portion of the funnel has a reddish, velvety lining, and partially filling the cavity is a transparent, slightly tenacious mucus. Sections from the red lining show that it consists of a mucosa identical with that of the intestine, and that it has an outer coat of non-striped muscle fibres.

3. *Cystic Cavities in the Abdominal Wall at the Umbilicus.*—In a few cases there was noted a slight watery discharge from the umbilicus, and on examination a small fistulous opening was detected leading directly inward for from one to several centimetres. These cavities were partly filled with mucus, and lined with a velvety membrane which proved to be intestinal mucosa. They may lie external to or beneath the aponeurosis, and in at least one instance the cavity had no connection with the outside.

4. *Meckel's Diverticulum.*—This may extend up to and be firmly attached to the peritoneum at the umbilicus.

5. *Intestinal Cysts.*—Meckel's diverticulum may be nipped off and form a closed sac lined with intestinal mucosa having muscular walls and an outer peritoneal surface. Several such cases are on record. These cysts usually contain nothing but mucus, indicating that they have been cut off at an early period, at a time when no meconium is present in the intestine.

6. *Patent Omphalomesenteric Duct.*—A large number of cases have been reported. If the fistulous opening be large, serious consequences usually follow. When the cord comes away, a red nodule at the umbilicus is noted, and fluid escapes. Fæcal matter is usually passed through the rectum. In the course of a few days, when the child cries or strains, the umbilical picture changes, and a little dome-like elevation is seen in the fistulous tract, and in a short time a sausage-like mass several inches in length may be seen literally rolling out of the abdomen. This represents the small bowel, which is being turned inside out through the fistulous opening (*Fig.* 11).

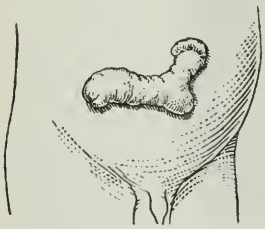


Fig. 11.—Inversion of the patent Meckel's diverticulum and its complication with intestinal prolapsus.

Adenomata, if ligated, usually drop off in a few days. They may be ligated and at once cut off. It is important to tie, as the pedicle contains large vessels. In all such cases the parents should be cautioned to watch the child carefully, because in a certain percentage of these children a Meckel's diverticulum exists and is firmly attached to the umbilicus. If at any time signs of intestinal obstruction develop, an exploratory section should at once be performed.

Where a funnel-shaped umbilicus is present, and the deeper portion is lined with mucosa, it seems advisable to make an elliptical incision, removing the entire area and at the same time exploring to see if Meckel's diverticulum is attached to the umbilicus. If so, it should be removed.

When a very small fæcal fistula is present, it may be advisable to wait a few months to see if it will not close. If it is still open at the expiration of six months, it should be dissected out down to the ileum and removed. Even should it close, the child should be carefully watched for signs of obstruction.

Where the fistulous opening is large, it should be removed at once. With the child in good condition the danger is not great. When prolapsus of the bowel with inversion has occurred, however, as a rule signs of shock have already supervened, and the chances of success even with operation are very remote.

Malignant Growths of the Umbilicus.—

1. *Primary Squamous-celled Carcinoma.*—This is very rare, and even in the majority of the supposedly authentic cases there is a doubt as to the accuracy of the diagnosis. The gross appearance is identical with that of a skin cancer elsewhere. The process seems to be a slow one, and on histological examination the typical appearance of squamous cell growth is clear.

2. *Primary Adenocarcinoma.*—This appears to be more frequent than that of the squamous-cell type, but is still excessively rare. When present it is due to malignant transformation of persistent epithelial remains of the omphalomesenteric duct.

3. *Sarcoma.*—But few cases are on record.

4. *Secondary Carcinoma.*—From a clinical standpoint this is the most important change encountered at the umbilicus. It may be secondary to cancer of the stomach, gall-bladder, or other viscus.

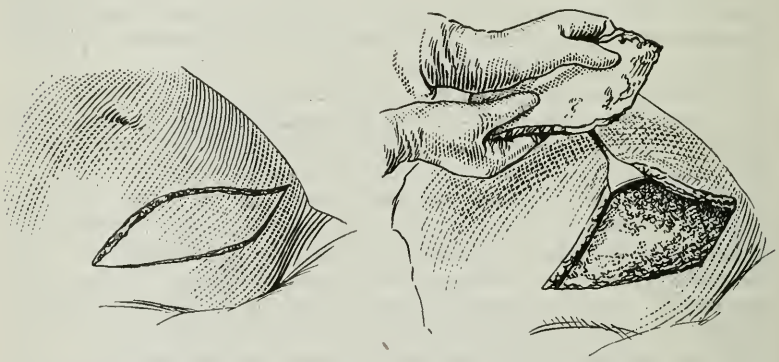
In these cases the carcinoma has extended to the under-surface of the liver, either by the lymphatics or by continuity. It has then travelled along the suspensory ligament to the umbilicus. The umbilical growth, accordingly, lies extraperitoneally between the peritoneum and the fascia. From this point it gradually spreads through the surrounding fat as a rather diffuse growth.

If an umbilical nodule be detected in a middle-aged person, the condition of the abdominal organs must at once be thoroughly investigated, and symptoms or signs pointing to a lesion of any viscus will usually be correctly interpreted as pointing to a carcinoma of that organ. It is obvious that removal of the umbilicus, though sometimes indicated for the relief of local pain, will not of itself work a cure, and in the majority of cases the stage of remedy is already passed.

The Pfannenstiel Incision.—Jashke,[4] writing from Kroemer's clinic in Grufswald, praises the Pfannenstiel incision, which has been employed there in about 1000 cases. The advantages claimed are: (1) A better cosmetic result; (2) the possibility of getting the patient out of bed sooner than when the linear incision is used; (3) Diminished

danger of subsequent hernia, which he places at from 0 to 0·9 in opposition to 1·8 per cent in linear incisions, which were the best figures found for the latter method. The incision has heretofore been strictly confined to clean cases, but Jashke reports two cases of peritonitis followed by wound infection in which such an excellent and competent scar was obtained, that he is inclined to extend the use to such cases. For this purpose it is advised to close the fascia with interrupted sutures and to apply over the wound for the first twenty-four hours a sand-bag as a compress. The wound must be inspected early, and if infection is present, it should be drained until clean, when with Michel clamps the edges may be approximated and a linear scar secured. [Caution is needful in adopting this suggestion. There is undoubtedly greater danger of diffuse abdominal phlegmon in the incision, and the report, though enthusiastic, does not include enough cases to place its use in this field beyond the experimental stage.—J. B. D.]

Removal of a Wedge of Skin and Fat to Facilitate Intra-abdominal Operations.—Following his advocacy of the removal of a portion of the fat of the abdominal wall (lipectomy) in excessively obese persons coincidentally with an abdominal operation, Kelly[5] has adapted the operation to another field, viz., for the purpose of facilitating operation. After pointing out the difficulty and often danger of working in the



Figs. 12, 13.—Showing the method of removing fat from the abdomen.

deep well occasioned by the excessively thick abdominal walls of the obese, he states that he has been able to obviate this awkwardness in most instances by a large oval excision of the skin and fat down to the fascia. *Figs.* 12 and 13 make the method sufficiently plain. All bleeding vessels must be carefully tied. Closure is effected by fine catgut sutures catching a distinct layer of fascia about the middle of the fat, silkworm-gut sutures uniting both skin and fat.

References.—[1]*Lancet*, 1910, ii, 445; [2]*Ibid.* 1336; [3]*Jour. Amer. Med. Assoc.* 1911, Feb. 11; [4]*Münch. med. Woch.* 1910, 2283; [5]*Ann. Surg.* 1911, i, 364.

ABSCESS OF BRAIN. (*See* NASAL ACCESSORY SINUSES.)

ACETONÆMIA. (*See* VOMITING.)

ACIDOSIS. (*See* VOMITING.)

ACNE VULGARIS. *E. Graham Little, M.D., F.R.C.P.*

Lovejoy and Hastings have made cultural experiments with the acne bacillus. They confirm its anaerobic preferences, but note that with care it can be grown aerobically when planted in heavy masses; the preferential media in their experience were gelatin-agar, glucose-agar, or broth.

ACROMEGALY. (*See* BRAIN.)

ACTINOMYCOSIS.

Vol. 1910, *p.* 142)—For the pulmonary form **Potassium Iodide** is recommended also **Copper Sulphate** gr. $\frac{1}{8}$ t.d.s. Treatment by **Vaccines** has proved useful.

ADDER BITE.

(*Vol.* 1911, *p.* 143)—**Stimulants** should be given, and heat to the surface; a **Bier's Bandage** should be applied above the level of the bite, with incisions and antiseptic dressings locally. **Anti-Venom Serum** may be useful.

ADENITIS, CERVICAL. *Priestley Leech, M.D., F.R.C.S.*

Starr Judd[1] gives the result of a study of 649 operations in this disease from St. Mary's Hospital, Rochester, Minnesota. There are approximately 800 glands in the entire human body, and nearly 300 of these lie within the tissues of the neck. No lymphatic vessels pass upwards or communicate at any point within the skull from the neck. The glandular system of the neck terminates on either side in one or two large lymphatic vessels, which empty on the right side into the internal jugular or subclavian veins, and on the left side directly into the thoracic duct. It has no direct communication with the lymphatic system in the thorax. Poirier and Cuneo, speaking of the afferent vessels of the supraclavicular group, say, "On the other hand, these glands receive no vessels coming from the mediastinal glands. Cases of adenitis following mediastinal or abdominal neoplasms can only be explained by a retrograde thrombosis of the afferent vessels of these supraclavicular glands." This is an important point. A great deal of the incomplete and half-hearted work done in removing these glands has been due to the conviction that the diseased condition extended down into the mediastinal glands. A more thorough study of the anatomy of this region shows that direct extension from the cervical glands into the mediastinal glands is impossible, and therefore that inflammations and neoplasms affecting the cervical lymphatics are local until they pass into the general circulation. It is therefore accepted that the best treatment of accessible tuberculous lesions when they are still local is excision. Occasionally we may find the bacilli in a decayed tooth or in the tonsil, but more often the point of invasion cannot be found. Examination of several hundred tonsils showed tubercles in less than 1 per cent. Experimentally it has been

found that cultures of tubercle bacilli swabbed over the surface of the tonsils may invade the glands draining the tonsils without obvious lesion of the tonsil itself. From the history, Judd finds in his cases that in 80 per cent the first enlargement was beneath the upper end of the sternomastoid muscle ; in 18 per cent it was in the submaxillary, submental, or parotid regions. In four cases the first cervical gland to enlarge was in the supraclavicular group ; in each of these four cases the axillary glands were also involved, the infection having presumably entered through an abrasion of the finger or hand. Several cases followed closely upon suppurating otitis media. Enlarged glands in children of between 4 and 10 years are often found ; the pathological changes may be hyperplastic or tuberculous, and there is no differential diagnosis between the two in the initial stages. These glands invite tuberculous infection. In these cases adenoids, tonsils, other nasal disease, decayed teeth, etc., should be treated. This, followed by tonic treatment and out-door living, will cure most cases. Caseating glands must be removed ; if the glands continue to enlarge and others become involved, complete excision should be done. If there is a discharging sinus the proper treatment is to curette, and swab with equal parts of tincture of iodine and carbolic acid ; excision is not indicated until the sinus is healed. The incision Judd uses is somewhat transverse ; it begins a little below and behind the mastoid process, extends straight down along the outer edge of the trapezius muscle, and then curves forward a little below the middle of the neck to terminate at the junction of the sternomastoid and clavicle. If the submaxillary and submental groups are involved, a second incision two fingerbreadths below and parallel to the lower jaw, is used. To prevent formation of a wide ugly scar, it is essential to turn back the platysma muscle and the skin in each flap, and it is also important that the platysma be sewed together before closing the skin. Drainage is effected through a stab incision behind. The dissection commences at the posterior border of the sternomastoid, and the fascia is dissected free as low down as the pulley of the omohyoid ; the glands are dissected upwards with the fascia as one mass. As soon as the internal jugular vein is exposed, it is best partially to occlude its lumen with a gauze pack in the lower angle of the wound ; this keeps the vein full, and prevents the entrance of air if the vein is torn. Recurrence occurred on the site of a former operation in 8·6 per cent, 5 per cent died of pulmonary tuberculosis, and 2½ per cent of tuberculosis other than pulmonary.

Tuberculous Adenitis and the Tonsil.—Mathews[2] says the infrequency of clinical tonsillar tuberculosis, and the hitherto almost uniform failure to demonstrate it microscopically, have made some surgeons question the etiological importance of the tonsil in cervical tuberculous adenitis. Other avenues of infection are the gums, nose, pharynx, and even the skin of the face, lips, and scalp. During the last ten years Mathews has seen 25 cases of tuberculous femoral adenitis following scratches on the foot. One child under six months of age had a tubercu-

PLATE III.

ADENOMA SEBACEUM

(Graham Little)

lous inguinal bubo following a scratch with a diaper pin at the base of the penis. The results of the examination of 65 whole tonsils recently removed are as follows: Fifty-seven tonsils removed for a variety of reasons, where there was no cause to suspect tuberculosis in the neck or other part of the body, showed no tuberculosis on microscopic examination. Five tonsils showing well-defined tuberculous lesions were taken from children with recent tuberculous cervical adenitis. There were three cases with tuberculous glands in the neck without tuberculosis in the tonsil. From his experience tuberculosis does not greatly enlarge the tonsil. One patient, with a suppurating submaxillary gland, had a red spot on the upper gum at the insertion of the second incisor tooth, about $\frac{1}{4}$ in. in diameter; on removal, this piece of gum and the glands showed typical tuberculous lesions. Osborne[3] examined 2,474 children as to the correlation of enlarged glands with decayed teeth, enlarged tonsils, and adenoids. From the tables he drew up it would appear that the presence of decayed teeth, of enlarged tonsils, and of adenoids, are all associated with an increased incidence of glandular enlargement; but this increase appears to be much more pronounced in the case of tonsils and adenoids, and comparatively little in the case of carious teeth.

For action and use of **Tuberculin,** *see page* 60.

REFERENCES.—[1]*Ann. Surg.* 1910, Dec.; [2]*Ibid*; [3]*Brit. Med. Jour.* 1911, Jan. 14.

ADENOMA SEBACEUM. *E. Graham Little, M.D., F.R.C.P.*

Adamson[1] reported an interesting case of adenoma sebaceum in a mother and her child, an uncommon but not unprecedented occurrence. In both cases the eruption consisted of oval yellowish or reddish tumours, with much telangiectasis of the neighbouring parts of the nose and cheek; the eruption was congenital in the mother, and appeared at the age of four years in the child; the usual mental deficiency noted in cases of this disease was not present. The treatment for this condition remains unsatisfactory, **Electrolysis,** which is the chief resource, being tedious and painful. In the discussion on these cases, Galloway suggested using **Carbon Dioxide Freezing.**

Plate III depicts a case of adenoma sebaceum of the red variety, the so-called "Pringle" type, drawn for us from a case shown some years ago by Dr. C. H. Thompson, at the Dermatological Society of Great Britain.

REFERENCE.—[1]*Brit. Jour. Derm.* 1911, 109.

ALBUMINURIA. *Francis D. Boyd, M.D.*

An important discussion on the *after-history of cases of albuminuria occurring in adolescence* was held in the Medical Section of the Royal Society of Medicine.[1] Goodhart, who opened the discussion, found that the condition was a fairly common one. As was well known from the cyclic character of the albuminuria, the best time to catch these cases *flagrante delicto* was in the mid-morning hours. It was astonishing what large quantities of albumin might be present. The urine was

usually of high specific gravity and readily deposited urates. This was quite in accord with the view that the error was largely a digestive one, that defectively-prepared products, or even acceptable material, reached the kidney in too great excess for the secreting cells to deal with. He had come to think that the condition was unimportant as regards duration of life ; but he could not agree that if it were, as had been suggested, due to strain upon the smaller vessels during exertion, a mechanical exudation could not be otherwise than harmful, and ought, one would think, in a number of cases to be accompanied by the appearance of blood in the urine. A sudden flux of digestive products was a much more likely explanation. A great number of the sufferers were pale, flabby, overgrown, and highly nervous subjects, with splashing stomachs and perhaps slow digestions. It had been contended that intermittence of the albuminuria was no proof of a sound organ, as intermittence was well known to occur in some degree in pronounced renal disease, both acute and chronic ; but he held that it was still more true to say that it was no proof of a structurally diseased organ. Marked intermittences in albuminuria were in his mind associated with cases which might not unreasonably be grouped together as of a toxic nature, cases, for instance, of uric acid and albumin replacing each other in storms quite gouty in their character, and others where, after a few weeks of failing health, but with healthy urine, the urine suddenly became loaded with albumin, which might or might not subside. Such cases mostly sailed under the licence of acute nephritis, and such they might become ; but the very suddenness of their onset was much more in accord with some toxic state that had actually but temporarily damaged the secreting cells. The cases varied in severity, from those which often led on to structural change and destruction of the organ, to subtoxic states of adolescent albuminuria. These latter attacks came and went without any risk to the renal structure, and after a time left the subject almost invariably sound. The extreme variations of albuminuria often seen, from large quantities to none at all, within short periods of time, are very unlikely to be due to structural fault in the kidney. The absence of after-history in these cases was very instructive. Of 202 cases, an after-history could only be obtained in 38 ; 164 had apparently passed from the care of the medical man under whose charge they were, and the speaker thought if any bad result or persistent albuminuria had been common, he should have heard of it in at least a small proportion of cases. Never in the course of his experience had he come across a single instance of a case passing on to Bright's disease.

In the discussion which followed there seemed general agreement that the *albuminuria of athletes* could not be considered " functional." In *orthostatic albuminuria*, when there is no albumin in the urine passed on rising in the morning, but it appears during the forenoon, the causal factor was to be found in the posture, and not in the food, according to some observers ; but others held that posture plus food in a person of a nervous temperament was necessary for its produc-

tion. *Lordotic albuminuria*, a true type of functional albuminuria, was of the pre-renal type. The essential feature was a lumbar lordosis causing pressure on the renal veins. There was no intermission in these cases, but there was no cardiovascular disturbance, and no alteration in the blood-pressure.

The DIAGNOSIS of functional albuminuria requires care, and is at times by no means easy. Specimens of urine must be taken at different times in the twenty-four hours, and it is essential that albumin should be absent some time during the twenty-four hours.

The PROGNOSIS in these cases is good, the after-history satisfactory, and the duration of life unaffected. The condition may persist for years, but does not necessarily affect the general health.

REFERENCE.—[1]*Proc. Roy. Soc. Med.* 1911, ii, 109.

ALCOHOLISM AND INSANITY. · (*See also* NARCOMANIA.)

Norah Kemp, M.B., C.M.

In an article dealing with the question of the relationship of *chronic alcoholism* to the various forms of insanity, Mott[1] speaks of the confusion which may arise from considering alcohol as the cause of the insanity when it may only have been a coincidence. To decide this, certain information is necessary: for example, The cause of the patient taking to drink. What drink and what quantity of drink had been taken. For how long had the patient been drinking, and had he been in the habit of drinking with food or instead of it? Was the drink easily got at his occupation, or did his work produce thirst? Did the patient take it to relieve depression, or was the intemperance simply a sign of the mental breakdown, as frequently happens in general paralysis of the insane, manic-depressive insanity, or involutional melancholia. Many neurasthenics, hysterics, epileptics, imbeciles, degenerates, eccentrics, and potential lunatics are very susceptible to the effects of alcohol, and in such cases the mental weakness is more the cause of the drunkenness than the result of it.

At Charing Cross Hospital, Mott had seen a large number of patients. the subjects of chronic alcoholism, who had for many years drunk large quantities of beer or spirits, or both, and had shown no sign of insanity, but only a lack of will power and moral sense, as a result of this vicious habit. Among these patients many had become intemperate in the pursuit of pleasure, and others were engaged one way or another in the liquor traffic. All these were at the time in employment, which argues that when the effects of the liquor had passed off there was no marked mental deterioration in many. Occasionally delirium tremens occurred. Many had been admitted for liver affection and dropsy. There were a few cases of polyneuritic psychosis, more especially in women, but most of them left the hospital cured. After treatment, the mental symptoms in these cases passed off, but paralysis caused by the neuritis persisted for some time afterwards. In some cases mental enfeeblement remained.

This polyneuritic psychosis was more often met with in women than

in men, both in hospitals and as lums. In hospitals, the paralysis and neuritic symptoms, in asylums the mental symptoms, predominated. Many were married women who had acquired the habit of tippling secretly without ever having been drunk, and the chronic alcoholism was often associated with some other morbific factor, such as septic infection from one cause or another. In these cases, therefore, there might have been a mixture of causes to account for the mental and neuritic symptoms; yet without the alcohol these same symptoms would not have appeared. It is a fact that, both in hospital and private practice, many people are met with who drink large quantities of alcohol for long periods of time without becoming insane. One is forced to conclude, therefore, that there is an additional factor needed to produce insanity, viz., a neuropathic or psychopathic inheritance.

Cirrhosis of the liver and ascites he commonly found in the wards and post-mortem room of the hospital, but rarely in asylums. In the few cases met with in the post-mortem room of the asylum, the liver was large, and they occurred in persons with a well-marked history of chronic alcoholism, and who during life had suffered from polyneuritic (Korsakoff) psychosis. The fact that so few cases of cirrhosis of the liver were found post mortem in asylums is not accounted for by improvement having taken place in the liver during a long residence in the asylum, because in these cases the average time elapsing between admission and death had been short. Moreover, the most marked female case of cirrhosis had resided in the asylum for two years prior to her death, and previous to her admission she had been at Duxhurst. She had developed marked ascites while in the asylum, and died with a most pronounced hobnail liver. The few cases which exhibited liver enlargement or obvious naked-eye cirrhosis which might primarily be caused by alcohol were cases of multiple neuritic psychosis with well-marked symptoms, and permanent dementia caused by changes in the cell and fibre structure of the central nervous system. The one male patient who showed well-marked liver change had been seven years in the asylum.

Sullivan, Bevan Lewis, and MacDonald have established a regional dissociation between alcohol and insanity, for where there was least inebriety, as in inland and agricultural communities, there existed most pauperism and insanity. Where intemperance largely prevailed, as in maritime, mining, and manufacturing communities, there the ratio of pauperism and insanity was lowest. Mott believes that the migration of the mentally fit from the agricultural districts to the industrial centres, leaving behind them the feeble in mind and body to procreate their species, might account for these districts having a higher proportion of paupers and lunatics. Although the drink bill falls annually, the percentage of insanity in the population is rising.

With reference to the question of chronic inebriety among the feeble-minded, he quotes a statement from Dr. Branthwaite's report, 1905,

that 62 per cent of the persons committed to reformatories under the Act are found to be insane and defective in varying degree. Branthwaite's experience agrees with the statement that small quantities of alcohol act as a poison to all who inherit a lack of highest control. According to Savage[2] also, hereditary neurosis increases the risk of mental disorder following alcoholic excess and considerably modifies the chances of recovery in such cases. Mott groups the psychoses which occurred in the subjects of chronic alcoholism as follows: (1) Delirium tremens and Korsakoff's disease, both of which might terminate in permanent alcoholic dementia in which structural changes in the brain could be demonstrated; (2) Certain mental affections occurring in an individual either potentially insane or possessed of a morbid temperament; (3) Combination of the first two groups; (4) Dipsomaniacs.

The persistence of auditory hallucinations in an insane patient when the mind otherwise was clear, favoured the theory that alcohol was a co-efficient in the production of the disease. He regarded certain signs and symptoms as pointing to alcohol as an effective cause of insanity, such as those indicative of an attack of delirium tremens, those of visceral disease, and the evidence of neuritis associated with any of the characteristic mental symptoms of Korsakoff's syndrome. Certain mental symptoms are equally characteristic: morbid jealousy and suspicions connected with the sexual and maternal instincts. Terrifying visual or auditory hallucinations, accompanied by delusions of being followed by policemen, etc., are equally characteristic, as well as delusions connected with the deranged sensibility of neuritis, and there may be the tendency to suicide or perhaps persistent exaltation. Amongst other conditions, he mentions mental confusion with loss of memory for recent events as being commonly associated with signs of neuritis. The more definite these neuritic signs, the more likely is well-marked cirrhosis of the liver, and the more likely is alcohol to be the effective cause of the insanity. Many of the female alcoholic cases at Claybury, diagnosed as such, were affected about the climacteric, and in the absence of definite post-mortem evidence of alcohol having been the effective cause, Mott was inclined to consider "change of life" to be the more important factor.

He thinks that the autotoxæmia resulting from alcohol met with least resistance in the cells of the brain, and consequently it was earliest affected. The principal *changes in the brain* in cases of alcoholic dementia are as follows: little wasting, and excess of cerebrospinal fluid in proportion; some thickening of the membranes over the frontal and central convolutions, with the fissures deeper and the convolutions smaller than normal in these regions. The membranes stripped off without leaving erosions, and there was no granulation of the ependyma of the ventricles, two conditions characteristic of general paralysis of the insane. The cerebrospinal fluid did not give the Wassermann reaction. Microscopic examination showed a diminution of the superficial fibre systems of the cortex, and there was

no increased vascularity. The chief cellular change was found in the Betz cells, which were swollen. The Nissl granules were absent or diminished, and if present were only found at the circumference of the cell. The nucleus was frequently eccentric in position. He was inclined to think there was some correspondence between the absence of the fibre staining in the superficial cortex cerebri and the degree and permanence of the dementia.

References.—[1]*Brit. Med. Jour.* 1911, June 10; [2]*Polycl.* 1910, Dec.

ALOPECIA AREATA.

Mercury Colloid (*page* 25).

AMŒBIASIS. (*See* Dysentery, Amœbic.)

ANÆSTHESIA, REGIONAL. *Charles Leedham-Green, F.R.C.S.*

The last few years have witnessed a revival of interest in local anæsthesia. Thanks to the work of Reclus, Schleich, Braun, and others, the technique has so improved that a large proportion of even major surgical operations can now be performed under its influence, not only without pain to the patient, but with greater ease to the surgeon than is possible under general anæsthesia.

Bearing in mind the present development of the method, and that it is the only form of anæsthesia which can be said to be devoid of all danger, it seems somewhat of a reproach that so little use is made of it in this country.

The following account of its technique is written in the hope of awakening a keener interest in this form of anæsthesia than at present prevails.* Space will only permit of the infiltration form being dealt with, and thus no mention is made of spinal, sacral, or intravenous anæsthesia. The first of these is now well known, and the last two are, at any rate at present, still in the experimental stage.

History.—The production of anæsthesia by the injection or infiltration of the tissues with an anæsthetic fluid dates from the discovery of cocaine. For a brief interval after its introduction, it seemed as if an ideal agent had been found, but soon emphatic warnings were published of dangers attending its use. The new drug was found to be decidedly toxic, in an uncertain and variable manner. It became plain that the injection of even a few minims of a concentrated solution was attended by considerable danger, and accordingly the rule was established that under no circumstances ought a solution stronger than 1 per cent to be used for infiltration purposes. With a solution not exceeding this strength, Reclus showed that a large number of major operations could be satisfactorily performed.

For many years attempts were made to discover a substitute for cocaine, which, whilst possessing its anæsthetic properties, should be

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* The writer wishes gratefully to acknowledge his indebtedness to Professor Braun, both for the help received from his works and for his kind permission to make use of the illustrations, *Figs.* 14, 15, 16, 21 (from his text-book on "Local Anæsthesia," 27, 29, 31, 32, 33 (from *Zeitschr. f. chir.*, Bd. iii. 1911).

free from toxic effects, and we have now a number of drugs which stand but a little below cocaine as anæsthetics and are practically free from toxic action. They are, however, by no means all suitable for infiltration anæsthesia, for several of them, notably stovaine, are decidedly irritating to the tissues, and may even give rise to sloughing. Up to the present it is generaly conceded that **Novocain** is the best preparation for the production of local anæsthesia by infiltration.

Shortly after the introduction of cocaine, Corning (1885) drew attention to the fact that if the circulation of the part was temporarily interrupted—say by an Esmarch bandage—at the time of the anæsthetic injection, not only was the risk of cocaine poisoning diminished, but the anæsthetic action of the drug was greatly increased. At the time, Corning's observation attracted but little notice in this country, but more recently great assistance has been derived by taking steps either entirely to interrupt the circulation by means of a tourniquet, or to produce a temporary anæmia of the part by the application of cold, or, still more conveniently, by the use of **Adrenalin.** The discovery of adrenalin has probably done more to advance the cause of local anæsthesia than anything else since the introduction of cocaine.

Technique.—For the majority of minor operations the simple infiltration of the tissues, with the anæsthetic fluid (1 per cent solution of **Novocain** in normal saline fluid, with the addition of two or three drops of **Adrenalin** to the ounce) at the site of the proposed operation is sufficiently effective. But this, the original method of inducing anæsthesia, has certain manifest disadvantages, notably when operating in an inflammatory area, for apart from the well-known difficulty and pain of producing satisfactory anæsthesia in inflamed tissues, there is the risk of spreading the infection. To overcome these defects, and to extend still further the field of regional anæsthesia, it has long been the aim of surgeons to endeavour to inhibit the sensory nerves at some distance from the site of the operation. For example, Corning, Crile, and others have shown that by the injection of a few drops of cocaine solution direct into a nerve, such as the sciatic, an immediate and complete anæsthesia is produced over the whole area of its distribution. As there are, however, but few nerves so situated that they can be thus injected, this method is rarely practicable, save when the nerve trunk is exposed by a preliminary incision. In other words, this *endoneural* injection is seldom a practical procedure.

Happily it has been shown that it is not necessary for the anæsthetic fluid to be injected actually *within* the nerve, but that it will inhibit sensory impulses if it come in contact with the nerve sheath. True, the resulting anæsthesia is nothing like so perfect, requires stronger anæsthetic solutions, and does not appear until the fluid has slowly diffused through the fibrous nerve-sheath (say twenty minutes or more). When making use of these *perineural* injections it is also necessary to bear in mind that the further the injection is made from the nerve-endings, the more difficult it is for the anæsthetic fluid to penetrate the fibrous-sheath of the nerve, and consequently the less certain is

the anæsthesia. This " blocking " of sensory nerves by perineural injections is practised in a variety of ways. It is seen in its simplest and most effective form in the *procedure of Oberst,* as applied say to the fingers or toes. A thin elastic tourniquet is tied round the root of the digit, then a 1 per cent solution of novocain in normal saline fluid, plus a few drops of adrenalin, is injected by means of a fine, sharp needle into the subcutaneous tissue close below the tourniquet. The diagram (*Fig.* 14) shows clearly the direction of the injection. *a* = the flexor tendon, *b* = the phalanx, *c* = the extensor tendon. The needle is inserted at the points 1 and 2, and the injection made in the direction of the arrows, so as to bring the fluid in contact with the nerves represented by the black dots. From 30 to 60 min. of the solution should be injected, and some 15 minutes allowed for it to act. By this means the whole of the finger—skin, joints and bones—is rendered perfectly anæsthetic.

Another method, that of *Krogius,* is at times useful. It aims at blocking the sensory nerves distributed to a part by injecting the

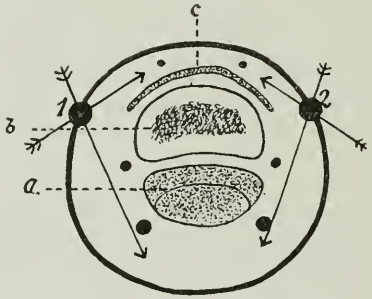


Fig. 14.

anæsthetic fluid at right angles to the course of the nerves as they run in the subcutaneous or subfascial tissue. This method is especially useful when dealing with the *scalp,* the terminal branches of the *fifth nerve,* and the superficial nerves of the *forearm and leg. Figs.* 15, 16, taken by permission from Braun's " Local Anæsthesia, ' illustrate this method. The anæsthetic fluid was injected along the dark line (*Fig.* 16), and, by " blocking " the great auricular and superficial cervical nerves, produced anæsthesia of the shaded portion.

The hand lends itself excellently to this form of anæsthesia. By means of perineural injections at the wrist the whole or any part of the hand can be rendered insensitive. The median nerve is " blocked " by the sub-fascial injection of, say, 60 min. of the novocain fluid around the nerve as it lies under the tendon of the palmaris longus. In about fifteen minutes complete anæsthesia results of the area supplied by this nerve in the hand (*Fig.* 17), and usually lasts for some hours. In the same way the ulnar nerve may be reached by inserting the needle from the inner side between the tendon of the flexor carpi ulnaris and the ulnar bone (*Fig.* 18).

To "block" the radial nerve at the wrist, the anæsthetic fluid should be injected subcutaneously across the lower end of the radius (*Fig.* 19).

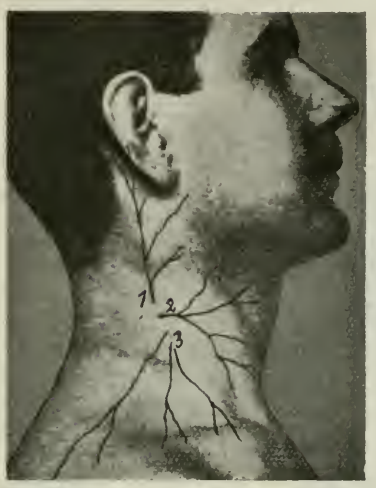


Fig. 15.—1 N. auricularis magnus ; 2 N. cutaneus colli ; 3 NN. supraclaviculares.

Hölscher believed that it was practicable to cut off all nerve impulses between the centre and periphery by infiltrating the whole of the tissues, skin, fasciæ, muscles, etc., of a section of an extremity. This

Fig. 16.

has, however, not proved feasible, the dilute anæsthetic fluid having too little influence on the larger nerves protected by their thick fibrous sheaths, even when Bier's intravenous method is employed ; although

anæsthesia is produced in the limb beyond the injected area, it is too uncertain to be of any practical value. For the majority of operations where local anæsthesia is suitable, the method first advocated by Hackenbruch, and improved by Braun, is perhaps the most useful, for

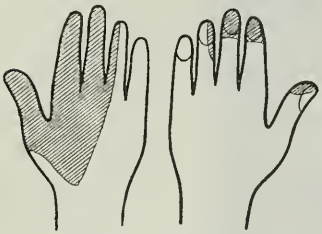


Fig. 17.—Median nerve.

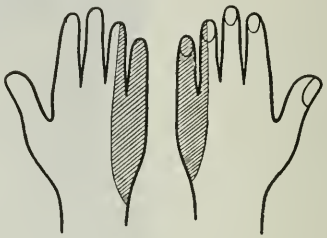


Fig. 18.—Ulnar nerve.

not only does it not require the exact topographical knowledge of the sensory nerves which the methods of Crile and Krogius do, but it aims at the relatively easy task of paralyzing the finer nerve branches

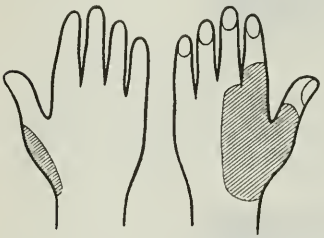


Fig. 19.—Radial nerve.

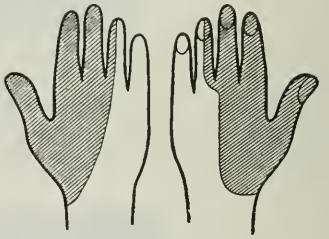


Fig. 20.—Median and radial nerves. To illustrate the anæsthesia produced by perineural injections at the wrist.

near to their distribution. The method consists in the injection of the anæsthetic fluid in a way as to surround completely the field of operation with an infiltrated area which shall effectually " block "

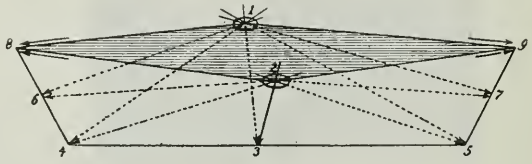


Fig. 21.

all the nerves passing to the part. The procedure is perhaps easier to understand by reference to *Fig.* 21, taken from Braun's book on " Local Anæsthesia," which represents in a diagrammatic way the plan of injection.

The area enclosed by 1, 2, 8, and 9 represents the superficial aspect of the field of operation, and the figures 3, 4, and 5 points in the muscular tissue. From the points 1 and 2, by means of a long needle, the deeper tissues are infiltrated with the anæsthetic fluid in the direction of 3, then successively 4, 5, 6 and 7, and lastly the subcutaneous tissue, by injection along the lines 1—8, 1—9, 2—8, 2—9. In this way, both superficially and deeply, the field of operation is shut off from the surrounding tissues by a broad zone of infiltration.

Fig. 22.

In *Fig.* 22 we have an illustration of the application of this method in the removal of an *epithelioma* or *carbuncle of the skin*. The skin is first frozen with the spray at the point *A*, and a long, fine exploring needle thrust under as far as point *C*, the anæsthetic fluid being injected freely as the needle is being introduced and withdrawn. This injection is repeated along the line *A D*, and again from *B* in the direction of *C* and *D*. In this way the site of the operation is surrounded by a zone of infiltration. Care must be taken, when using local anæsthesia for an inflammatory lesion, that the infiltration zone be placed well outside the area of inflammation.

The *scalp* lends itself pre-eminently to this method of anæsthesia. Indeed, there is hardly an operation on the scalp which cannot be done under its influence, and better than under general narcosis. For some time past I have used it for the majority of operations upon the skull, even such as trephining and the removal of cerebral growths (four cases). There is something almost uncanny in the ease with which the skull can be opened and the brain exposed while the patient is unconcernedly talking to the nurse. The advantage to the surgeon of being able to operate on a bloodless scalp, and to place his patient in any position without the encumbrance of an anæsthetic mask, is at once obvious. Suppose it is desirable to expose the cortical area about the fissure of Rolando, by the raising of a large trap-door flap of the

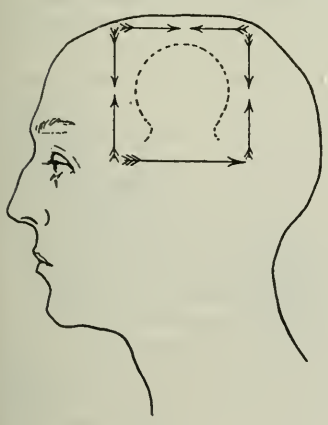


Fig. 23.

scalp and cranium. An injection of the anæsthetic fluid is made in a horizontal direction about an inch below the base of the proposed flap (*Fig.* 23). The needle is thrust between the scalp and the bone, and the fluid freely injected. In a similar way injections are made along each side of a rectangle, until the whole operation area is surrounded by infiltrated tissue. (Each side of the square will require fully 10 c.c. of the anæsthetic fluid.) An Esmarch bandage is then lightly applied to the scalp, and an interval of half an hour allowed for the anæsthesia to develop. At the end of this time the whole of the tissues within the infiltrated area—scalp, periosteum, bone, and even dura mater—will be found perfectly anæsthetic. Prior to opening the dura mater it is an advantage to give, with a fine needle, a small injection of a very dilute solution of novocain and adrenalin between the dura mater and the cortex of the brain. By so doing, not only is the dura mater rendered more certainly anæsthetic, but the resulting anæmia of the cerebral cortex greatly facilitates both the detection and the removal of the lesion.

As a further illustration of the efficacy of this method, and also of the lines on which local anæsthesia is developing, the region of the *face* may be dealt with. In contrast with the scalp, this region is not suitable for the simple subcutaneous infiltration method, save where the proposed operation is small and involves only the superficial tissues. If the deeper tissues are affected, this does not give a perfect anæsthesia, on account of the rich innervation by the large branches of the fifth nerve. It is therefore generally necessary either thoroughly to infiltrate the whole of the deeper tissues, or to "block" the affected branches of the fifth nerve as they emerge from the foramina of the skull. As these points of emergence are constant and readily located, this "blocking" is usually a simple matter. For example, to anæsthetize the *frontal and supra-orbital branches of the first division of the fifth nerve*, all that is necessary is to inject about 10 c.c. of the solution in a transverse line, as close to the upper orbital margin as is possible, from the outer to the inner angle of the orbit. This will give complete anæsthesia of the whole thickness of the upper eyelid and a considerable area of the scalp of the forehead above the line of the injection. The *large infra-orbital* branches of the second division, and the *mental* branches of the third, may be anæsthetized by injecting fluid in the neighbourhood of the infra-orbital and mental foramina respectively, and then introducing the needle as far as possible up the bony canal, and so bringing the fluid in direct contact with the nerve-stem. The effect of this injection of the infra-orbital nerve is to anæsthetize the lower eyelid, half the upper lip, the ala and tip of the nose, a large portion of the cheek (skin and mucous membrane), the gums, periosteum, and teeth (not the molars) of the superior maxilla on that side. *Fig.* 24 shows the effect of injection on both sides.

Both the *inferior dental and lingual nerves* are readily blocked by infiltrating the tissue about the two nerves as they lie on the inner side of the ascending ramus of the jaw just before the inferior dental

nerve enters the foramen in the mandible. To do this the needle of the syringe should be inserted under the mucous membrane covering the anterior border of the ascending ramus of the jaw, 1 cm. above the grinding surface of the last molar tooth of the lower jaw (*Fig.* 25). The point of the needle must be kept closely in contact with the bone the whole time, and the anæsthetic fluid injected as the needle is slowly pushed onwards. The lingual nerve is reached first, as it lies just behind and to the inner border of the jaw ; the dental nerve lies farther back, but is easily found if care is taken to keep the point of the needle in contact with the bone and the shaft of the needle parallel to the grinding surface of the molar teeth of the lower jaw.

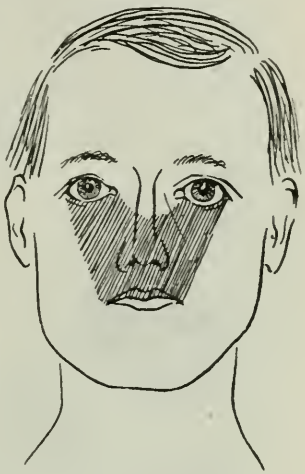


Fig. 24.

If the injection is successful, it soon produces an anæsthesia of the anterior two-thirds of the tongue on that side, as well as of the mucous membrane of the lower lip and the floor of the mouth. The molar, bicuspid, and canine teeth are rendered insensitive, but the incisors generally escape on account of their receiving branches from the inferior dental nerve of the opposite side.

A further promising development of the *anæsthesia of the fifth nerve* is the injection of the novocain into or around the three great divisions of this nerve as they emerge from the foramina at the base of the skull—a variation of Schlosser's method of treating trigeminal neuralgia by the injection of alcohol. Notwithstanding the depth at which these foramina are situated, it is surprising how readily, with practice, they can be reached by the needle. The resulting anæsthesia is so perfect that such extensive operations as the removal of the upper jaw have been successfully accomplished under its influence. In eight instances Braun has excised the superior maxilla, and on twelve occasions operated for cancer of the tongue and floor of the mouth, in each case dividing the lower jaw at the symphysis.

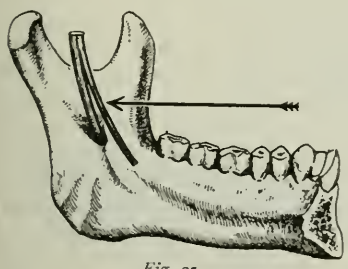


Fig. 25.

The branches of the *first division of the fifth* nerve are inhibited by a deep injection into the orbit in the region of the sphenoidal fissure. For this purpose a long fine needle is inserted at the outer orbital angle,

and, with its point kept close against the bone, thrust backwards for $4\frac{1}{2}$ to 5 cm. The point of the needle then lies in front of the sphenoidal fissure, and an injection of 5 c.c. of the novocain solution is made here.

The needle is then inserted at the upper and inner orbital angle, and, again keeping its point against the bony wall, passed backwards for 4 to 5 cm. and the injection repeated (*Fig.* 26). The injections produce a slight temporary proptosis of the eyeball and œdema of the upper eyelid, and a complete anæsthesia of the frontal, lachrymal, and nasal nerves.

The method is very simple, and can be carried out without pain to the patient. I have twice used it successfully for the removal of extensive orbital tumours.

Fig. 26.—To reach sphenoidal fissure from in front.

The *second division of the fifth nerve* is "blocked" by an injection into, or around, the nerve as it emerges from the foramen rotundum. The needle is inserted just below the malar bone at a point where a line drawn vertically downwards from the external margin of the orbit cuts the lower border of the malar bone. It is directed upwards, inwards, and backwards, grazing the outer wall of the upper maxilla till the point enters the pterygopalatine fossa and strikes the nerve at a depth of 5 or 6 cm. (*Fig.* 27). (The correct position of the needle is proved by the patient experiencing a sharp pain about the face). Five c.c. of a 2 per cent solution of novocain are then injected.

Many methods have been suggested by which an injection can be given to the *third division of the fifth nerve* as it emerges from the skull through the foramen ovale. Ostwalt makes use of a long needle, bent at an obtuse angle, which is introduced through the widely opened mouth behind the last molar tooth in the upper jaw. The point of the needle is kept in close contact with the inner surface of the external pterygoid plate, which serves as the guide to the foramen ovale (*see Fig.* 28).

A simpler method, and one which I have always found effective, is that suggested by Offerhaus, which is to insert the needle immediately below the middle of the zygomatic arch, and to thrust directly inwards until the point strikes the base of the external pterygoid plate. The point of the needle is then about 1 cm. in front of the foramen, to reach which the needle is partially withdrawn, and then thrust slightly backwards to the same depth as before (*Fig.* 29).

A sharp pain down the lower jaw is the indication that the nerve has been reached.

Another method, which I have also used successfully, is to employ a rather longer needle, and insert its point at the front of the face, immediately below the malar process of the superior maxilla. The needle is thrust backwards and slightly upwards till the point strikes the sphenoid bone in the region of the foramen ovale (*see Fig.* 30).

Fig. 27.

Whichever method is selected, it is necessary to have a skull at hand as a guide to the correct directing of the needle.

Those who have had experience of the treatment of neuralgia by the injection of alcohol, will find that the production of temporary anæsthesia by novocain is much easier than the destruction of the nerve by alcohol, for the simple reason that in the latter case, unless the nerve-trunk is actually struck by the point of the needle, a satisfactory result is not obtained, whereas it is not necessary that the needle should be so accurately directed when using novocain.

Fig. 28.—To reach the foramen ovale from the mouth.

Occasionally, it is true, one meets with an abnormal skull where the injection is difficult to manage, and the anæsthesia is either absent or imperfect; but, if I may judge from my own experience (one failure in a dozen cases), this seldom occurs. When, however, the injection is successfully carried out, it enables the surgeon to perform under the most favourable conditions such extensive and severe operations as excision of the upper or lower

maxilla, or amputation of the tongue. For not only can the patient be placed in the most convenient position for the surgeon, without reference to the anæsthetist, but the greatly diminished vascularity of the parts, together with the maintenance of the laryngeal reflex, considerably reduces the risk of post-operative pneumonia, and renders unnecessary the taking of any operative steps to prevent the entrance of blood into the trachea.

Fig. 29.

It is, of course, essential that the anæsthesia should be perfect throughout the operation area; accordingly, when extensive procedures are contemplated, it is usually necessary to "block" two of the divisions of the fifth nerve on the affected side, and often one on the other side, and, further, to surround the site of operation as far as possible by an infiltration of the integuments, both to exclude the innervation of the adjacent area and to produce a temporary anæmia with the adrenalin. *Figs.* 31 and 32 illustrate this as applied to excision of the upper jaw and tongue respectively.

Two of my recent operations well illustrate the technique and its advantages.

Case 1.—A young woman had a rapidly growing sarcoma of the right half of the lower jaw. An hour and a half before the operation, a small dose of scopolamine and morphia was given, to allay the apprehensions of the patient. Half an hour later 5 c.c. of a 1 per cent

Fig. 30.—To reach the foramen ovale.

solution of novocain were injected about the foramen rotundum, and a similar amount at the foramen ovale, of the affected side. Before

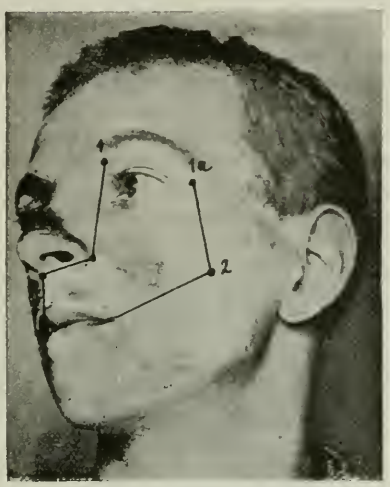


Fig. 31.—Scheme of infiltration for excision of the upper jaw. 1, 1a = the points where the needle is inserted for the median and lateral deep orbital injections. 2 = point from which to reach the foramen rotundum.

these injections, the skin was frozen with an ethyl chloride spray. Anæsthesia of the area supplied by the two divisions of the trigeminal nerve

Fig. 32.—Method of infiltration of the soft parts in excision of the tongue with division of the lower jaw at the symphysis. 3 = point for insertion of the needle for infiltration of the root of the tongue.

was noticed within a few minutes. The soft parts were then infiltrated in the median line from the free border of the lower lip to the hyoid

bone, then along a line drawn parallel to the hyoid bone, to the anterior border of the sternomastoid muscle, and then upwards to the lobe of the ear. When infiltrating the integument of the chin, the needle was passed close to the symphysis of the jaw, both anteriorly and posteriorly, to cut off the innervation of the left dental nerve. Here, and along the edge of the sternomastoid muscle, the novocain solution was injected very freely. Fifteen minutes after the completion of the infiltration of the soft parts, the operation was readily carried out and the right half of the jaw removed. The anæsthesia was in every way satisfactory except at the symphysis of the jaw. When this was divided, a little pain was felt through the incompletely anæsthetized left dental nerve,

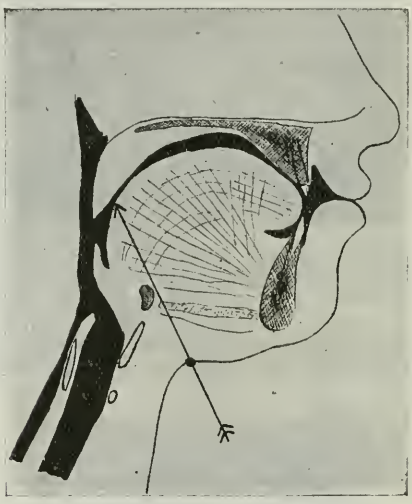


Fig. 33.—Line of infiltration of the root of the tongue.

which ought to have been " blocked " either at the foramen ovale or as it entered the dental canal.

Case 2.—Excision of half the tongue for epithelioma. Local anæsthesia was specially indicated in this case, as the patient, an elderly gentleman, was a heavy whisky drinker, with chronic nephritis and bronchitis. The epithelioma, though small, was situated towards the back of the tongue and causing great pain. A preliminary dose of scopolamine and morphia was given as in the previous case, and the third division of the fifth nerve " blocked." The tongue was then infiltrated with a ·5 per cent solution of novocain and adrenalin, both in the median line and at the root.

(Braun advises that the infiltration of the root of the tongue shall be done by inserting the needle in the middle line of the neck, close along the hyoid bone (*Fig.* 33). guided by means of a finger placed at the back of the tongue. In this way the whole of the root of the tongue

can be readily infiltrated from one tonsil to the other, rendering the organ bloodless, and anæsthetizing the branches of the glosso-pharyngeal nerve.)

After allowing fifteen minutes for the anæsthesia to develop, the patient sat up in an armchair, and with the greatest ease, without pain or loss of blood, the half of the tongue was excised through the mouth. The operation gave rise to so little discomfort that the patient regarded it as trivial, and did not retire to bed until his usual hour. A week later, again under local anæsthesia, the affected cervical glands were extirpated.

REFERENCES.—Le Brocq, *Brit. Med. Jour.* 1909, Mar. 27; Wheeler, *Dublin Jour. Med. Sci.* 1909, May; Green, *Jour. Amer. Med. Assoc.* 1910, June 11; Hertzler, Brewster and Rogers, *Ibid.* Oct. 28; Cohen, *Ibid.* 1909, Dec. 4; Braun, Leipzig, 1907; Ibid. *Deut. med. Woch.* 1911, 30; *Ibid. Zeit. f. Chir.* 107; Crile, *Jour. Amer. Med. Assoc.* 1902, Feb.; Cushing, *Ann. Surg.* 1900, Jan.; Hackenbruch. 1898, 87; Hölscher, *Münch. med. Woch.* 1899, 8; Krogius, *Centr. f. Chir.* 1894, 11; Peuckert, *Beitr. z. Klin. Chir.* lxvi, 2; Sinclair, *Jour. Cutan. Dis.* 1905, July; Corning, *N.Y. Med. Jour.* 1885, 317; Oberst, *Deut. med. Woch.* 1890, 14; Ostwalt, *Berl. klin. Woch.* 1906; Offerhaus, *Arch. f. Klin. Chir.* Bd. 92, 1.

ANAL FISSURE.

(*Vol.* 1910, *p.* 29)—Suppositories of **Escalin** (an aluminium-glycerin paste) are recommended. They should be warmed before introduction, and two used daily, one after defæcation and the other before bedtime.

ANAPHYLAXIS. *E. W. Goodall, M.D.*

A few years ago, Ch. Richet, studying the problem of immunity, found that if he subcutaneously injected a dog with a non-lethal dose of a toxin derived from the tentacles of certain actiniæ, and if further he waited for a definite interval and then injected a non-lethal dose of the same toxin into the same dog, the animal was quickly seized with certain symptoms, serious and often fatal. The animal appeared to have become over-sensitive to the toxin. To this condition of over-sensitiveness Richet applied the term "anaphylaxis." After the serum-treatment of certain diseases, especially diphtheria, had been in vogue for a very short time, it became known that about one-third of the patients treated with serum developed symptoms due to the serum, in most cases not till at least a week after the injection of the serum; that is to say, not till after the termination of what may be called an incubation period. The usual symptoms were a rash and pyrexia, accompanied in a few cases by signs of slight polyarthritis. To this symptom von Pirquet and Schick applied the term "serum-sickness." The serum used for the treatment of human disease is mostly horse-serum. It was observed that the serum derived from some horses was more prone to produce an attack of serum-sickness than that from others; and also that some persons were more liable than others to these unpleasant effects of serum. It was further noticed by more than one observer that very occasionally the incubation period was reduced, and that it might be reduced to a few hours or even minutes. To the form of serum-sickness which appeared

after the usual interval, the term "normal-reaction" was applied; but when the symptoms came on within a few minutes or hours, von Pirquet and Schick called it an "immediate reaction," and when from one to five days an "accelerated reaction." It was further noticed that in the accelerated reaction the symptoms were of the same nature as in the normal reaction, though they might be more severe; but in the immediate reaction the symptoms were different and often alarming, viz., a profuse rash coming out rapidly, a high temperature, dyspnœa and cyanosis, occasionally with a rigor, convulsions, and collapse; and it was further noted that the immediate and the accelerated reactions occurred more often in persons injected with serum *previously* by *at least two weeks or more*. If a person was re-injected within that period, no immediate or accelerated reaction followed. The person, therefore, who suffered from these reactions, which may be termed abnormal, was in the same condition with regard to horse-serum as were Richet's dogs to the toxin of the actiniæ: they were in a condition of anaphylaxis.

But after the lapse of time, other facts connected with these untoward results of serum became known. In the United States the treatment of asthma by the subcutaneous injection of horse-serum was advocated, and many persons were so treated. Unfortunately, in not a few of them the results were immediately disastrous. The immediate reaction occurred, in several cases with a rapidly fatal termination. Again, the same untoward accident happened in persons injected with serum for the first time for diphtheria or as a prophylactic measure after exposure to the infection. In some of these cases the individual was asthmatic, or sensitive to the emanations from a horse, in that proximity to that animal evoked an asthma-like attack; but not in all. Hence it is clear that some persons are naturally over-sensitive to horse-serum.

While these clinical observations were being made, a number of experiments in the laboratory, undertaken mainly to elucidate the problem of immunity, but also during the manufacture and testing of antitoxic sera, were throwing light upon the subject. Arthur found that if 5 to 10 c.c. of horse-serum were subcutaneously injected into rabbits, no local symptoms resulted; but if the injection was repeated several times at intervals, the site of injection became infiltrated; later, after other injections, the local lesion became more pronounced, and finally gangrenous. At the sixth or seventh injection the animal died almost immediately. The rabbit had, therefore, become more and more sensitive to the horse-serum with each successive injection. In the guinea-pig the signs of anaphylaxis are even more marked and serious. (For details, see *Medical Annual*, 1911, p. 164.)

In order to produce the reaction the same protein as was used for sensitizing must be employed. The reaction is thus specific, though the sera of closely allied animals are to a certain extent interchangeable.

It has been stated above that the term anaphylaxis was applied in the first instance to the condition produced by sensitizing an animal

with a protein, so that on re-injection with the same protein certain symptoms were produced. It has also been stated that, at any rate in man, these symptoms are occasionally observed after the injection of serum in persons who have never before been so injected. But recently the term anaphylaxis appears to have been extended to every condition of increased susceptibility, so that what has been called above the normal reaction, is now taken to be evidence of the anaphylactic state, and to be an anaphylactic phenomenon. It should, however, be pointed out, that it by no means follows that if a person exhibits the normal reaction, even severely, after a first injection, he will necessarily undergo a normal, let alone an accelerated or an immediate, reaction, after a second injection a few weeks later. On the other hand, a person may have a normal reaction after a primary injection, and an immediate, an accelerated, and a normal reaction, all three, after a second injection.

Recently attention has been drawn to the fairly close resemblance that exists between the symptoms of anaphylaxis observed experimentally in animals and in treatment by serum in man, and those noted in certain diseases, especially those in which repeated attacks occur, such as asthma and hay-fever. Further, it has long been known that certain persons exhibit peculiarities towards certain things, e.g., to shell-fish, certain drugs, to the handling of certain articles (leaves, caterpillars, etc.), the stings of insects, etc. Urticaria, which is the commonest of the rashes occurring in serum-sickness, is often provoked by the above causes. It may, therefore, be stated that persons who exhibit an idiosyncrasy towards an object, are in an anaphylactic condition as regards it; and that this condition may be natural (congenital) or acquired. This state can be transmitted from the female guinea-pig to her offspring. It is extremely probable that the group of anaphylactic diseases may have to be extended widely in order to include certain diseases which at first sight would not appear to be of that nature, e.g., puerperal eclampsia.

Prevention.—Many attempts have been made to rid serum of its toxic properties, but one of the chief difficulties lies in the fact that measures successful in eliminating toxicity also destroy the antitoxic property of the serum. Certain observers claimed that atropin, others that alcohol or ether, prevented anaphylactic shock; but these claims have not been supported by more recent experiments. Wolff-Eisner and Ascoli have recommended that for a second injection the serum of an animal of a different species from that from which the serum for the first injection was derived, should be employed; but I am not aware whether this suggestion has been carried out. In one or two cases where a fatal result has followed immediately upon the injection of antitoxic serum, the anatomical evidence of the status lymphaticus has been found post mortem. A. E. Hodgson has accordingly treated a number of cases of diphtheria with antitoxin, some with and some without **Thyroid Gland** in the form of tablets. The thyroid substance was given simultaneously with, and for some

days following, the administration of antitoxin. The dosage was, 1¼ gr. daily for six doses, for children up to 5 years of age ; a smaller amount for infants ; from 5 to 10 years, 2½ gr. daily, for six doses ; from 10 to 15 years and upwards, 5 gr. on alternate days, for four doses. Hodgson treated 100 cases, 50 with and 50 without thyroid substance. The antitoxic serum used was one known to be producing a large incidence of rashes. The number of cases treated is not large ; but so far as the figures go, the results suggest that the thyroid extract can lessen the incidence of serum-sickness.

In actual practice the fact of anaphylaxis introduces three questions : the propriety of giving serum (1) to a person suffering from an attack of diphtheria, or any other disease treated by a serum, who is known to be the subject of asthma or any similar disease ; (2) for a relapse of the disease ; and (3) as a prophylactic.

In respect of (1) the chief consideration is the severity of the attack to be treated. Not every asthmatic is liable to anaphylactic shock, so that if the patient was suffering from laryngeal or any severe form of diphtheria, I should give him antitoxin and risk the anaphylactic shock, for in such a case there would be a much greater chance of his dying of diphtheria than of the results of supersensitization. With regard to (2), there is here the additional risk of an increase of susceptibility to serum caused by the first injection, so that the relapse of the disease would have to be very severe to justify the re-injection of serum. As for (3), the immunity produced by antitoxic serum is temporary only, lasting at most for about six weeks. While there are some instances of outbreaks of diphtheria in institutions for the care of children, in which the use of antitoxin as a prophylactic, given cautiously and after due enquiry into the children's life-history, may be justified, an indiscriminate use of serum as a prophylactic is not only unnecessary but unjustifiable.

References.—Donaldson, *Med. Chron.* 1911, i, 64 ; Hirshberg, *Jour. Amer. Med. Assoc.* 1910, Oct. 15 ; Billard, *Lancet* 1909, Oct. 22 ; McKeen, *Boston Med. and Surg. Jour.* 1911, Apr. 6 ; Hodgson, *Lancet* 1911, i, 373 ; Goodall, *Brit. Med. Jour.* 1911, i, 292 ; Milen and Root, *Therap. Gaz.* 1910, Feb.

ANEURYSM. (*See also* Aorta, Dilatation of, *and* Collateral Circulation.) *Carey Coombs, M.D., M.R.C.P.*

Diagnosis.—Jordan,[1] writing on the *x*-ray diagnosis of aneurysm within the chest, says it is not enough to examine the patient from before and behind only ; he must be revolved in front of the light. The right anterior oblique position, with the right shoulder forward, is the best, as this gives an " end-on " view of the arch of the aorta. The only form of aneurysm which can then remain hidden is a small sac in the concavity of the arch. (*See also page* 70.)

Treatment.—The **Introduction of Wire** into the sac, with or without the passage of a **Galvanic Current,** has been discussed by several writers. Eshner's[2] paper contains a summary of thirty-six cases from the literature, with two of his own. He thinks that in most of

these cases the treatment was justified by the results. It is contra-indicated in fusiform aneurysm. The technique is simple, and local anæsthesia will often suffice. Under aseptic conditions a hollow needle of gold, silver, or platinum, insulated except at its tip, is introduced into the sac at its most prominent point, and through this gold or silver wire is fed into the sac. Usually ten to twelve feet are needed. If the wire kinks before the sac is full, the needle may be withdrawn and re-introduced elsewhere. If it is desired to add the effect of galvanism to that of the wire itself, the end or ends are connected with the positive pole of a battery, the cathode being placed on the back; a current rising gradually from zero to 60, 80, or 100 milliampères, and as gradually falling, is passed through for an hour or an hour and a half. There is no bleeding apart from a spurt when the needle is inserted. Pain, dyspnœa, and pulsation are all quickly mitigated. In Eshner's table it is seen that exactly half the cases died within a month of the wiring; the best result was that of a man who lived twelve years after the operation. Autopsy usually shows that clotting has been assisted by the process of wiring. Tyson[3] records a case treated by wiring only, in which the patient survived less than two months. Beardsley,[4] after describing two cases treated by the Moore-Conradi method (wiring with galvanism), says the operation would be of more service if it were practised earlier, as soon as the sac is located in an accessible position, and before weeks and months of pain have exhausted the patient's strength.

Abrams[5] describes in detail his **Spinal Percussion** method of treatment. He claims that systematic percussion of the seventh cervical spine provokes a reflex contraction of the aneurysmal aorta, and thus leads to a cure. He speaks of enduring relief afforded to forty cases by this method.

Aneurysm of the Hepatic Artery.—Zesar[6] says the causes are those of aneurysm generally: infective (especially syphilitic) arteritis, and arteriosclerosis. The chief symptoms are pain, which may simulate biliary colic; jaundice, which is in some cases remittent; hæmorrhage into the gastro-intestinal tract; and irregular fever. In some instances an abdominal swelling was felt, which was pulsatile in a few cases.

References.—[1]*Brit. Med. Jour.* 1910, Nov. 15; [2]*Amer. Jour. Med. Sci.* 1910, Oct.; [3]*N.Y. Med. Jour.* 1911, i, 966; [4]*Ther. Gaz.* 1911, Mar.; [5]*Brit. Med. Jour.* 1911, ii, 70; [6]*Fortschr. d. Med.* 1910, Nos. 42, 43, 44.

ANGINA PECTORIS. *Carey Coombs, M.D., M.R.C.P.*

Treatment.—Mackenzie[1] describes the case of a neurotic man of thirty-five with aortic insufficiency, whose attacks of angina were easily provoked, and accompanied by crises of high arterial tension. Amyl nitrite and even chloroform gave only transient relief; more lasting benefit was derived from full doses of **Ammonium Bromide.** Verdon[2] was able to terminate a severe and almost fatal attack by the introduction of a **Stomach-tube** and deflation of the stomach, over-distention of which appears to have provoked the attack. Fiessinger[3]

emphasises the importance of **Rest in Bed.** It reduces the arterial tension, restores the contractility and tone of the myocardium, and reduces its excitability. To give the maximum benefit, it should last from two weeks to two months, and the diet should at first be restricted to milk and water, gruel and so on being added gradually. The needful drugs should be given as well.

Adalin may be tried (*page* 3), and **Vasotonin** is also reported as successful (*page* 64).

REFERENCES.—[1]*Heart*, ii, 265; [2]*Lancet*, 1911, ii, 362; [3]*Bull. de l'Acad. de Méd.* lxxiv, 359.

ANKYLOSIS.

Ionization employed for this condition (*page* 94).

ANKYLOSTOMIASIS. *Leonard Rogers, M.D., F.R.C.P.*

In the Milroy Lectures in March, 1911, A. E. Boycott[1] dealt fully with the subject of *ankylostoma infection*, using this wide term to indicate the presence of the parasite with or without any symptoms due to it, as opposed to ankylostomiasis or actual illness produced by the worms. His experience of the disease was limited to the Cornish mines, which present the advantage for study of an infected group of some 6000 workers living among a generally uninfected population, such as is not met with in the tropics. The deep mines alone afford a temperature high enough to be favourable to the worms. The following are the most important points in the life history of the worms, from the practical point of view. Two days after the eggs are passed out of the human bowel, the young worm may hatch out in favourable circumstances, but the period may be prolonged to a week or more. In four to ten days more the larval worm moults several times and becomes the full-grown larva about 0·6 mm. long, though without any sexual differentiation, in which condition it may remain for many months until an opportunity occurs of entering its human host, but it cannot multiply in this stage. The observation of Giles that the worms may become sexually mature and reproduce themselves outside the body, has been proved to be erroneous, the forms he described belonging to other very common nematodes. The general mode of infection is that described by Looss in 1898, namely, by passage through the skin, usually with local inflammatory changes known as "ground itch" or "coolie itch" in Assam, "mazamorra" in Porto Rico, and "bunches" in Cornwall. They ultimately reach the gastro-intestinal tract by the roundabout way of the bronchial mucous membrane and up the trachea to the pharynx, and may produce slight bronchitis in the process. Infection by the mouth also occurs, as was shown experimentally by Leichtenstern and confirmed in his own person by Boycott, this being the usual route of infection in the case of such widespread worms as *trichocephalus* and *ascaris*, which were found in four-fifths and one-quarter respectively of Cornish tin-miners. Only the full-grown larvæ, and not the eggs, are thus infective, so that fæces do not become infective until after at least

four days, and immediate re-infection cannot occur as in the case of *oxyuris*. There is, however, evidence that the larvæ may live for twelve to fifteen months under artificial conditions, and in nature it is probable that they may survive as long as two or three years. The period between the entrance of the adult larvæ into the body, and the appearance of eggs in the fæces, is from six to ten weeks, whether they enter by the skin or through the mouth. In the tropics, opportunities for reinfection are so numerous that it is difficult to ascertain how long the adult worms may live in the human body. In Cornwall, however, it has been found that when infected miners leave off work in the mines, with its opportunities for infection, their symptoms tend to improve gradually, owing to a diminution in the number of worms they harbour. Nevertheless, the ova have been found in their fæces up to six years in Cornish cases, and for still longer periods in America.

Symptoms.—In early or mild infections these may be absent, but the proportion of infected persons who are anæmic is in general parallel with the proportion of the whole population who are infected. In the Cornish Dolcoath mine, 95 per cent were infected, and about 5 per cent were ill to a material degree. In Porto Rico, where the whole agricultural population were infected, half showed a high degree of anæmia with under 50 per cent hæmoglobin, frequent re-infection being a potent factor in producing severe disease. There has been much discussion on the pathology of ankylostoma anæmia, but it has now been shown by the carbon monoxide process of Haldane and Lorrain Smith, that the anæmia resembles that of chlorosis in that the percentage content of hæmoglobin does not correspond to the actual deficiency, owing to a considerable increase in the plasma and the total volume of the blood. On the whole, therefore, in ankylostoma anæmia there is comparatively little shortage of hæmoglobin, nearly the whole of the anæmia being due to an increase of the plasma, so that it is a hydræmic plethora. This accounts for the fact that men with only 40 to 50 per cent of hæmoglobin were working regularly in the mines and might have no other symptoms. The real deficiency of hæmoglobin in Boycott's cases amounted to only about 15 per cent. The amount of blood actually sucked by the worms is very small, while there is rarely evidence of much loss by hæmorrhage from the bites. No very active hæmolytic poisons are secreted by the worms, while iron is not in excess in the liver as it is when the blood is being dissolved in the system. The essential change, therefore, is an increase in the plasma, with a secondary compensatory reduction in the colour index. The small defect in the total hæmoglobin may be attributed to the local action of the worms in the bowel.

Diagnosis.—This is made by finding the ova in the stools; but in mines in temperate climates the prevalence of the disease can more conveniently be gauged by counting the number of eosinophile leucocytes in a series of blood-films. When the ova are few, a small piece of fæces is shaken up in a test tube, and after standing for ten minutes to allow the eggs to settle to the bottom, the supernatant

fluid is poured off. By repeating this three or four times the chance of finding them is much increased. A still more accurate method is Bruns' plan of cultivating the larvæ from the fæces by placing a thick layer of fæces on a pile of circular pieces of blotting paper 2½ in. wide in a Petri dish containing water nearly to the top of the papers. After incubating at 30° to 37° C. for five to seven days, the water is centrifuged and the free swimming larvæ are easily found. During the first seven to ten weeks after infection no ova will be present in the fæces, but the eosinophile increase appears within three weeks. In Cornwall the average number of eosinophiles in infected miners was 18 per cent. Over 8 per cent was considered to be a definite eosinophilia, and from 5 to 8 per cent suspicious. This change is most marked in young, recently infected persons; in long-standing cases they are much less, while in severe anæmia they may be even fewer than normal, which is of bad prognostic significance. The eosinophilia usually decreases after removal of the worms by treatment, yet an eosinophile increase may persist for a long time after cure, so that it is not certain evidence of the actual presence of the worms in the intestines. In the tropics other causes of this blood-change, such as bilharzial, filarial, and other intestinal worm affections, must be borne in mind. The absence of eosinophilia in a fairly robust subject may usually be taken to exclude ankylostomiasis. The conditions which favour the development of the larval stage are a free supply of oxygen and moisture, with a temperature of 68° to 90° F., the optimum being about 80° F. It is for this reason that in temperate climates it is found only in the hot deep mines with a temperature of over 70° F., although widespread in the tropics. The presence of 2 to 3 per cent of **Sodium Chloride** prevents the development of the larvæ, as in Levant mine in Cornwall. Defective sanitation is the great cause of the disease in mines, leading to frequent opportunities of infection through the skin.

Treatment.—Prophylaxis is dependent on the facts already given, which indicate the measures necessary to prevent infection, combined with the use of drugs to expel the worms from those who harbour them. The experience of the Porto Rico Commission during ten years, in which they treated 300,000 cases, shows that **Thymol** is the best drug for this purpose. Male fern was useless, eucalyptus impracticable owing to its nauseating effects, while naphthol was effective, but may produce fatal nephritis if the kidneys are already somewhat diseased. Two or three 30-gr. doses of thymol are to be given at hourly or two-hourly intervals, alcohol being avoided during its use. After three doses, 90 per cent of the persons treated passed no more ova. One or two doses will expel most of the worms and restore the patient to active work. In the Westphalian coalfields an elaborate crusade has been carried on for some years, with the aid of frequent microscopical examinations of all the men employed, in order to stamp out the disease completely. After one year, the number of infected men had been reduced by 75 per cent, and after six years by 95 per cent, and all sickness abolished. Still the infection has not

been eradicated as expected, although no expense was spared. In the Belgian coalfield also, good results have been obtained. In the tropics greater difficulties are met with, owing to the infection being more widespread. In Porto Rico in 1899 Ashford found that 15 per cent of the deaths were due to anæmia, and half the population were badly anæmic. In the last six years 300,000 patients have been treated at the dispensaries, and 90 per cent made healthy at the cost of 2s. 6d. per head. Similar campaigns would be advisable in other infected tropical countries.

Herbert Gunn[2] deals with hookworm disease in Californian mines. In some, with a temperature over 70° F., there was a large amount of infection and evident anæmia among the miners. Blood-counts showed eosinophilia in as many as 90 per cent of the men in some places. He estimates a loss of at least 20 per cent in efficiency, with great economic loss, as a result of the disease.

William Litterer[3] has tested Bass' statement that 7 per cent of female ankylostoma failed to produce ova, but found it in only 1 per cent, and does not think the defect to be due to old age of the worms.

Brimont[4] has tried **Essence of Niaouli,** or *Melaleuca viridiflora,* a near relation of eucalyptus, in the treatment of ankylostomiasis, with good results. He prescribes:—

℞ Essence of Niaouli	4 grams	Chloroform	3 grams
Oleum Ricini	40 grams		

preceded the day before by a purgative, if the patient is constipated. After one dose the number of eggs found fell to 10 per cent, and after a second dose five days later to 1 per cent.

Burton Nicol[5] records his experience of the treatment for the expulsion of ankylostoma in the case of Indian coolies emigrating to Natal. They were healthy persons, yet about 90 per cent harboured these worms. Attempts to treat them on the voyage to Natal or at the depots in Madras were not successful, but on arriving at Natal they were sent to a camp and dealt with there. **Thymol** and **Beta-naphthol** were the drugs employed, the latter being preferred as it is less depressant, and in Nicol's hands safer, than thymol in these healthy people. He met with one fatal case of acute nephritis in nearly 9000 patients, and also one in a Natal Hospital. In Porto Rico beta-naphthol was given up on account of the number of deaths from acute nephritis, but most of the patients were markedly anæmic. Nicol gives three doses of 30 gr. each at two-hourly intervals, with a purge before and after.

References.—[1]*Lancet* 1911, i, 717, 783, 859; [2]*Jour. Amer. Med. Assoc.* 1911, Jan. 28; [3]*Ibid.* 1910, Oct. 15; [4]*Sem. Méd.* 1910, Sep. 28; [5]*Jour. Trop. Med. and Hyg.* 1911, 50.

ANTHRAX.

E. Graham Little, M.D., F.R.C.P.

Mitchell[1] has had an extended experience of anthrax among wool-sorters, and urges the earlier use of **Sclavo's Serum,** given either hypodermically or intravenously, or by the mouth, the average dose being

40 c.c., and about 230 c.c. being used in a single case. Serum fever and skin eruptions are infrequent. They occur about the ninth day, and are accompanied by joint pains.

REFERENCE.—[1]*Brit. Med. Jour.* 1911, Ap. 1.

AORTA, DILATATION OF. *Carey Coombs, M.D., M.R.C.P.*

McCrae's[1] article gives a systematic account of this important subject, based on a study of sixty cases. In 80 per cent the age was between thirty and sixty, males formed 90 per cent of the whole. Syphilis is important, but not to so great an extent as in aneurysm. Other infections, especially the rheumatic infection, play a part. Great effort, especially if sudden or occasional, is a factor.

MORBID ANATOMY.—It is usual to find the lesions of aortitis, syphilitic or otherwise. The aorta may stretch as far as the diaphragm, but never beyond. Thrombosis is rare. The aortic valves are often incompetent, either because they are diseased, or by stretching of the aortic ring.

SYMPTOMS AND SIGNS.—McCrae speaks of four clinical groups: (1) Latent cases—physical signs of dilated aorta, but no symptoms; (2) Cardiac cases—symptoms and signs of myocardial insufficiency, with signs of aortic dilatation; (3) Cases in which angina calls attention to the condition of the aorta; (4) A fourth group, in which the heart on examination is "practically normal." In such, the symptoms are dyspnœa, weakness, œdema, and pain, slight in degree, provoked by exertion, excitement, or food, and referred to the præcordium, shoulders, or arms; while *physical examination* discovers fullness of the veins in the neck, chest, and arms, with arterial pulsation in the episternal notch and in the subclavians, which often arch abnormally high. Pulsation is seen in the first and second interspaces of both sides at their sternal ends, especially in the second right interspace. This may be so forcible as palpably to lift the manubrium in systole, and a diastolic shock is often felt. Percussion discloses an area of dullness of the kind shown in the accompanying diagram (*Fig.* 34). The second sound, particularly at the base, has a characteristic amphoric quality, which is often shared by the diastolic bruit of regurgitation if such be present. The arterial pressure is often low rather than high. The *X*-rays disclose a definite but diffuse widening of the aortic shadow. In McCrae's experience, *pressure effects* are common, though they are less serious than in aneurysm; he mentions swelling of veins, inequality in the radial pulses, tracheal tug, recurrent hydrothorax, and unequal pupils,

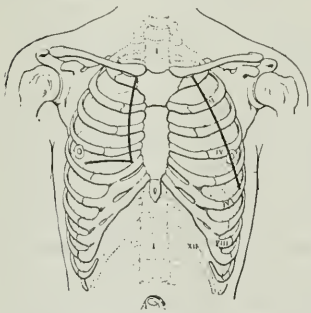


Fig. 34.—The area of dullness in dilatation of the arch of the aorta.

as being of fairly frequent occurrence. Among *associated conditions* he noted thickening of the palpable arteries in about two-thirds, and aortic incompetence in nearly half. Renal disease is common.

DIAGNOSIS.—Here the principal task is to exclude aneurysm; though mediastinal tumour, and uncovering of the base of the heart by retraction of the lung, have also to be thought of.

COURSE.—This is determined by the condition of the heart, its valves, and its muscle.

TREATMENT.—**Rest,** which is indicated when cardiac symptoms are present, should be brief but absolute. In other cases, of course, a relative degree of rest may be needed; for instance, it may be needful to order the patient to alter his occupation. The chief **Dietetic** indication is reduction in quantity, especially of meat. No alcohol is to be allowed, and the fluid intake should be generally reduced. Free action of the bowels is to be secured; McCrae specially recommends **Hydrarg. c. Creta** overnight, followed by a saline next morning. **Potassium Iodide** in doses of from 3 to 10 gr. three times daily should be given for long periods. If the blood-pressure is high, or pain persistent, the **Nitrites** should be given cautiously.

REFERENCE.—[1]*Amer. Jour. Med. Sci.* 1910, Oct.

APHONIA. (*See* LARYNX.)

APOPLEXY.

May be averted by **Venesection** (*page* 10).

APPENDIX VERMIFORMIS.

John B. Deaver, M.D., LL.D.
D. B. Pfeiffer, A.B., M.D. } *Philadelphia.*

The activity and interest of surgeons in other quarters of the abdomen, together with the relative completeness of our knowledge of appendical diseases, combine to make the contributions upon this subject less numerous and forcible than its continued importance deserves. There have been, however, during the past year several papers of great interest.

MacCarty[1] has gone over the large material of the Mayo clinic, comparing the case histories with the pathologic findings in 2000 cases. Of these specimens 1005 were removed for appendicitis alone, while 995 were removals incidental to other conditions, such as fibroids, ovarian cysts, etc. His studies lead him to believe that the so-called physiological obliteration of the appendix does not occur, and that all such changes take place as the result of inflammation. Of all appendices removed at operation, 23·5 per cent were partially or completely obliterated. The shortest duration of the process of obliteration is less than 10 years, and the process may be complete at ten years of age. In this series 22 cases of carcinoma (0·6 per cent) were found. It occurred as early as five years and as late as eighty. There was nothing in the clinical history to suggest its presence in any instance, and 31 per cent of the carcinomata were found in appendices

removed in association with other abdominal conditions. Of all the carcinomata found, 77 per cent were not capable of being diagnosed by the gross external appearance.

Diverticula of the appendix was found in 17 cases. They were usually multiple, and the largest was only 0·5 cm. in diameter. It was found also that appendices removed in conjunction with operation upon the gall-bladder showed a higher percentage of lesions than removals incidental to other abdominal conditions. MacCarty is therefore led to speculate upon the possibility of appendical inflammation being the precursor of infective processes in the bile, leading ultimately to cholecystitis and gall-stones.

EXPLANATION OF PLATE IV.

MR. HERBERT PATERSON'S CASES OF ACUTE APPENDICITIS.

Fig. A.—Girl, 16, taken ill the morning before admission with severe abdominal pain; left work but did not go to bed. Supper of fried fish on previous evening. Next day, still some pain, easier towards evening; vomited once. On the evening previous to the onset of the pain she had had a supper of fried fish. On admission she looked in perfect health; temperature 99·4 F., pulse 114. Pain refered to the right iliac fossa; here also tenderness on deep pressure, but no rigidity. At operation, appendix found acutely inflamed, greatly swollen and œdematous, full of pus, and gangrenous in its middle area. No adhesions.

Fig. B—Woman, 25, taken ill two days before admission with pain in lower abdomen and vomiting. Following day, pain easier. On admission, fairly healthy appearance, not much pain; temperature 101° F., pulse 112. Abdomen not distended or rigid. Tenderness, with a smooth, oval, hard mass in right iliac fossa. Operation: cæcum enormously thickened and infiltrated, forming the swelling felt before operation. Appendix greatly enlarged, and distended and gangrenous at base, allowing escape of pus, fæces, and large concretion. End of caput coli gangrenous. No adhesions.

Fig. C.—Girl, 14, taken ill with vomiting and severe abdominal pain three days before admission. The pain, which patient called "bad stomach ache," increased in severity, but was eased by lying down. On admission, pallor, complexion earthy, tongue moist and furred: temperature 102° F., pulse 132. Abdomen not distended, no rigidity over rectus, some slight deep tenderness and resistance in right iliac fossa. Free fluid in peritoneal cavity. Appendix found much enlarged and bound down by adhesions in right iliac fossa, on separation of which 1 oz. foul pus escaped. Appendix ashy grey and constricted, containing concretion. Distal half distended with pus. Mucous membrane generally gangrenous; perforation at one spot. Good recovery.

Fig. D.—Boy, 17, taken ill with sudden pain in abdomen three days before admission. Went to work first and second days. On admission temperature 101° F., pulse 100. Tenderness all over abdomen, especially right iliac fossa. Abdomen rigid, knees drawn up. Appendix deep down behind caecum, in a pocket of dark brown offensive pus; perforated, with concretion lying loose. Satisfactory recovery.

The principle of the *early operation* in appendicitis has now won its way almost completely. Many practitioners, however, of both conscience and standing, still feel that they can differentiate the cases that do not require operation from those in which it is necessary. They tell us, as Paterson[2] says, that "each case must be judged on its merits." This is one of those high-sounding phrases that do not stand the test of practical application. The accompanying pictures graphically represent the condition of the appendices in four cases which Paterson narrates, and for which he has kindly furnished the accompanying drawings and notes (*Plate IV*), in which both symptoms and physical signs were of the mildest character, and not at all indica-

PLATE IV.

CASES OF ACUTE APPENDICITIS WHICH OFFERED ONLY MILD CLINICAL FEATURES

Fig. A

Fig. B.

Fig. C

Fig. D.

From drawings kindly lent by Mr. Herbert Paterson

tive of the deadly nature of the lesion found. Had he decided these cases "upon their merits," it is certain that the lives of the patients would have been greatly jeopardized. As Murphy has said, "We should have no deaths from appendicitis, *but we are having them.*" What is needed is a united front on the part of the profession making our practice accord with the accepted principle.

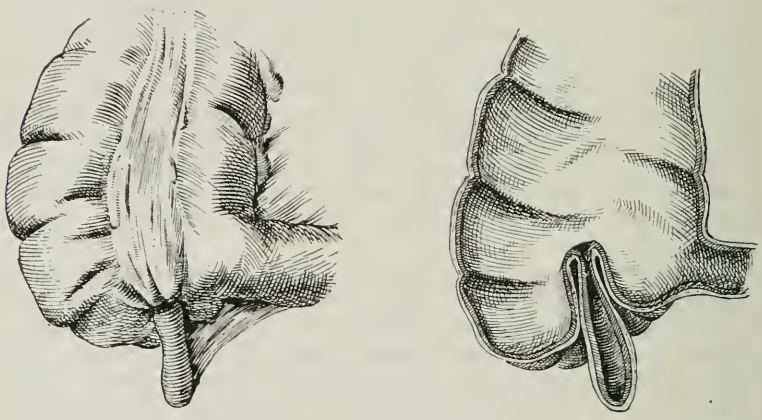
The *frequency of appendicitis in childhood* is emphasized by the fact that H. C. Deaver[3] is able to report 500 personal cases. The operative mortality was 4·6 per cent. Four hundred and three cases were of the acute variety. It should be borne in mind that the younger the child, the more deeply in the pelvis lies the appendix, owing (according to Salter) to the deep position of the cæcum in the right iliac fossa. Bladder symptoms are common. Churchman says that all urinary symptoms in childhood suggest the possibility of appendicitis. On the contrary, it should always be remembered that right-sided abdominal symptoms suggestive of appendicitis may be set up by pneumonia, and the chest should be carefully examined. The exceedingly rapid and severe course of acute appendicitis has been observed by all who have had occasion to operate upon children. Both opium and purgatives are categorically condemned in this condition by the writers. Drainage is used only when the exudate is purulent or in large quantity. Glass tubes are recommended for the pelvis, though a tube was broken in one case. It is never allowed to remain more than three days when, if drainage is still necessary, rubber should be substituted. Gauze is used sparingly.

"*Appendicular dyspepsia*" is now a well-established clinical entity. Perhaps the best definition yet proposed is that of Maunsel;[4] "It is a group of symptoms, and perhaps signs, which point so strongly to organic gastric or duodenal disease that it is only by most careful examination or by the supervention of definite appendicular symptoms that a correct diagnosis is probable." No history of indigestion is complete which does not seek to elicit specifically the symptoms of appendicitis, and no physical examination should omit the careful consideration of the signs of appendical trouble.

Carcinoma of the Appendix.—Two additional cases of this interesting condition are recorded by Kennedy.[5] Both were discovered only upon microscopical examination of the appendix, and evidently had produced no metastases. As cases of microscopical carcinoma of the appendix accumulate, it becomes increasingly evident that the history of this form of tumour is far different from that of carcinoma elsewhere. In no other organ is carcinoma encountered so frequently as an accidental finding. Yet the cases of malignant invading and metastasizing carcinoma arising in the appendix are few in number. If carcinoma of this organ behaved as does carcinoma elsewhere, this surely would not be the case, and the incurable cancers would certainly outnumber those which are fortunately removed in the local stage. It may be urged against this statement that many carcinomata of the cæcum may have arisen in the appendix; but against this is the fact that carcinoma of

the cæcum is not a very common condition, its incidence according to age does not correspond to the histological carcinoma of the appendix, and in the majority of cæcal carcinomata removed early, the appendix is clearly not the point of origin. The histological appearances also vary considerably. An attempt has been made to explain the apparent non-malignancy of these malignant-looking carcinomata of the appendix by classifying them as endotheliomata. This may explain certain cases, but by no means all, for the evidence that certain of these growths arise from the appendical epithelium is unmistakable. This whole subject deserves careful correlated clinical and pathological work. In the meantime the clinician will do well not to give too gloomy a prognosis in cases of histological carcinoma of the appendix.

Intussusception of the Appendix.—Moschcowitz[6] reports a case of this condition and collects 24 additional cases. He is struck by



Figs. 35, 36.—Invagination of appendix.

the similarity of the symptoms, and thinks a diagnosis might be hazarded upon the following picture: A child in the first decade of life, with a more or less protracted history of repeated attacks of severe abdominal cramps occurring remittently with periods of well-being, who has a small palpable tumour in the right iliac fossa, and blood in gross or minute quantities in the passages, should be suspected of chronic intussusception of the appendix. The intussusception may be partial or complete. In the case reported it was partial, as depicted (*Figs.* 35, 36). Disinvagination was done and the appendix removed in the ordinary way.

A rare complication of appendicitis is reported by Grekow,[7] consisting in a fistulous communication between the appendix and the Fallopian tube.

Appendical Abscess.—A very recent trend in the development of surgical methods consists in the greater reliance placed in the use of

Antiseptics, which the rise of aseptic surgery had relegated largely to the background. The method of skin sterilization by iodine is a prominent example. Maylard[8] advocates the treatment of appendical abscess with pure carbolic acid and iodoform. His method is as follows:—

The abdomen is opened in the right iliac region by the usual "grid-iron" incision: extension of the wound should always be avoided if possible. If no adhesions are encountered between the visceral and parietal peritoneum sufficient to cut off effectually the general peritoneal cavity, gauze plugs are inserted so as to afford complete protection of the cavity when the abscess is opened. The abscess is now sought for by carefully breaking down the adhesions, and when once pus begins to well up it is rapidly swabbed away until the cavity has been freely exposed and practically dried. The appendix is then sought and, if reasonably possible, removed; the cæcal stump is touched with pure carbolic acid, and invaginated by a purse-string gut suture. The abscess cavity is freely wiped with a small gauze swab soaked in pure carbolic acid. An effort is made to reach every part of the cavity. A dry swab is then introduced to soak up any of the remaining acid, and immediately thereafter any amount of iodoform up to half a teaspoonful is put into the cavity, and smeared over its walls with a blunt instrument. A rubber drainage tube about a quarter of an inch in diameter is conducted to the lowest part of the cavity, and on one side of the tube a narrow strip of iodoform gauze is packed in zigzag fashion, just sufficient to fill the cavity; this, with the tube, is conducted out of the abdomen about the centre of the wound. The protective gauze plugs encircling the involved area are withdrawn, the edges of the wound dusted with iodoform, and closed by through-and-through silkworm gut sutures.

The after-treatment is as follows: On the second day after the operation, the iodoform gauze packing is partially removed; on the third day it is completely removed; and, however fetid may have been the pus at the time of operating, the plug will be found to be perfectly "sweet." On the fifth or sixth day the drainage tube is taken away, and on the tenth the stitches are removed. At the end of four weeks the patient is allowed up.

With this technique the 27 patients operated upon recovered without complication. Maylard thinks that, where proper precautions are taken to protect the general peritoneal cavity, this method of operating admits of every abscess being opened, and every appendix sought for and removed with perfect safety.

Technique of Appendicostomy.—Having had the misfortune to have the appendix slough after the operation of appendicostomy, Yeomans[9] has studied the circulation of the appendix, and advocates a method of operation which leaves its vessels intact. He separates the two layers of the mesentery at its junction with the posterior mural peritoneum, beginning at its free border, and carefully displacing the cellular tissue with its contained appendicular artery and branches

as far as necessary towards the appendix. The two layers of peritoneum are divided transversely up to the base of the appendix, turned in, and sewed to obliterate the raw space on the posterior abdominal wall. It is unnecessary to test at once the patency of the lumen, as the lumen admits of ready dilatation if too small, and if the appendix be left until the wound has healed, it may then be amputated about 1 cm. from the skin, the teat-like prominence thus left giving easy entrance to the tube. Further precautions are not to obliterate any arteries by ligation, sutures, forceps, tension, or torsion, or by closing the abdominal wound too snugly about it.

REFERENCES. — [1]*Jour. Amer. Med. Assoc.* 1910, ii, 488; [2]*Lancet*, 1911, i, 1272; [3]*Jour. Amer. Med. Assoc.* 1910, ii, 2199; [4]*Brit. Med. Jour.* 1911, May 6; [5]*Lancet*, 1910, ii, 1757; [6]*Med. Rec.* 1910, ii, 1088; [7]*Wien. klin. Woch.* 1910, 194; [8]*Brit. Med. Jour.* 1911, Mar. 25; [9]*Ann. Surg.* 1910, 808.

ARTERIOSCLEROSIS. *Carey Coombs, M.D., M.R.C.P.*

CEREBRAL SYMPTOMS.—Heard[1] describes cases exemplifying the transient nervous disorders which are symptomatic of cerebral arteriosclerosis, and as such may foreshadow the occurrence of hæmorrhage or thrombosis within the brain. There are various forms, such as hemianopia, aphasia, hemiparesis, localized paræsthesiæ, or epileptiform seizures. The possible factors in their production are discussed: local injury may be done to the brain by (*a*) Toxins; (*b*) Ischæmia from vascular spasm or failure of compensating hypertension; (*c*) Localized œdema.

Russell[2] speaks of three groups of cases in which cerebral arteriosclerosis produces certain enduring effects. (*a*) The patients exhibit the facies of paralysis agitans but without tremor. The reflexes are increased, and the plantar response is often extensor. Fugitive headache is common, especially in the occipital area. The prognosis is always bad. (*b*) Here the symptoms simulate those of neurasthenia. (*c*) The chief feature in this group is "apraxia," i.e., inability to put motor ideas into action; this may be unilateral, and if so is more often left- than right-sided. Treatment in all these forms is unsatisfactory. Mental rest must be insisted on.

TREATMENT.—Cowan[3] says it is best to begin with a strict régime, and to find by careful experiment the directions in which this may be safely relaxed. Mild but regular exercise, such as golf, is indicated. Rest in bed is needful in severe cases at first; this may be combined with massage, and the return to activity must be gradual. Diet is very important. In severe cases it should be restricted at first to three or four pints of milk daily, with or without farinacea. It may be citrated, peptonized, or soured, if the patient has digestive limitations. This is to be gradually expanded as far as the state of the digestion will allow. In any case the total intake of solid food is to be restricted, and especially that of meat. All foods notoriously indigestible (crab, goose, etc.) or decomposing game must be avoided, as well as all salted foods. Red meats and all consommés, etc., made therefrom should be forbidden. Liver and other viscera are contraindicated

because of their high purin content. Roast mutton may occasionally be allowed. There is no specific medicine, the essential point being to regulate the patient's life. However, symptoms require to be treated. With regard to the *reduction of high blood-pressure*, Cowan says this is always possible, but not always advisable; the "normal" pressure in an arteriosclerotic is that at which symptoms are in abeyance. Vasodilators, of which **Nitrites** and **Guipsine** are specially named, are for occasional emergency use. The periodic use of **Mercurial Aperients** is the best hypotensive. For *cardiac failure* he recommends **Caffeine, Diuretin, Alcohol,** and the **Ammonia Compounds,** with saline diuretics; also strong fresh **Tea** or **Coffee. Digitalis** is, as a rule, contraindicated; if given, it should be in the form of Nativelle's granules, Guy's pill, or Trousseau's wine. If *uræmia* threatens, free purgation and a large supply of fluid are indicated, with packs, and cupping.

For *cerebral symptoms*, Patschke[1] recommends the subcutaneous injection of **Tiodine,** ·2 gram three times weekly, up to twenty doses.

References.—[1]*Edin. Med. Jour.* 1910, Nov.; [2]*Med. Press,* 1910, Oct. 5; [3]*Pract.* 1911, June; [4]*Deut. med. Woch.* 1911, 1513.

ARTHRITIS. *Robert Hutchison, M.D., F.R.C.P.*

Etiology.—In spite of the amount of study devoted to it, the subject of arthritis continues to be involved in confusion. In an unusually philosophical paper on the principles underlying the study and treatment of chronic arthritis, Marshall[1] comes to the following conclusions: (1) The causes of chronic arthritis are many, and arthritis must be considered a symptom of many diseases rather than an entity that is produced always by the same specific cause. (2) Causes generally are common diseases of other organs, common infections and ordinary defects of personal hygiene rather than obscure and rare diseases. (3) The most severe deforming types of arthritis that stubbornly resist treatment, and the mildest kinds that are easily controlled and permanently cured, have similar origins. They differ only in the degree of severity with which the underlying causes act. (4) Arthritic disease in every stage may often be modified by treatment, sometimes only slightly, and sometimes to a great degree, permitting permanent cures not infrequently. (5) The best period to initiate treatment is in the incipient and early stages before chronicity is established, although the later stages also must be attended to when the disease has progressed to that degree. (6) Diagnosis and treatment of incipient and early arthritis depend upon thorough knowledge of physiological conditions that control health and normal activity of joints, and cures result when defects in these conditions can be recognized and remedied. (7) Proper application of simple hygienic measures and correction of defective personal habits are the most adequate means of treatment in the early stages.

The commonest causes of arthritis, according to this writer, are bacterial infections, digestive disturbances, abnormalities in metabolism

associated with puberty, pregnancy and the menopause, and unstable conditions in nerve cells controlling the joints.

TREATMENT.—Marshall says that general hygienic methods of treatment consist in the regulation of personal habits, administration of medicinal tonics, and physical therapeutic measures.

Personal habits should be carefully investigated, occupations inquired into and changed when necessary; diet, sleep, rest, and exercise regulated; and mental disturbances and drug habits ascertained.

Medicinal tonics comprise such drugs as strychnine, quinine, iron, arsenic, iodides, phosphates, and others which exert their influence more or less upon the protoplasms of all tissues and help to repair defects that each is subject to.

Physical therapeutic measures consist in application of heat, light, and mechanical and electrical stimuli in various forms of baths and massage for the sake of their tonic effects. For the various forms of special treatment reference must be made to the voluminous literature upon the subject, as they include sun and air baths; artificial radiant heat baths; hot, neutral, and cold water baths, and these are often combined with mechanical friction or electricity and chemical substances in most confusing combinations. The importance of general hygienic measures in treatment of arthritis is here especially referred to, as these measures will be frequently mentioned in what follows.

The writer uses for routine treatment at hospital clinics the pharmacopœial preparations, tincture of **Nux Vomica,** and elixir of **Iron, Quinine** and **Strychnine Phosphates** for general tonics, and **Calomel, Magnesium Sulphate, Sodium Phosphate,** fluid extract of **Cascara Sagrada,** and **Rectal Lavage** with warm water at frequent intervals to clear the intestinal tract and regulate digestive functions. Usually treatment begins by purging with calomel and magnesium sulphate, and this is followed for several weeks with daily rectal irrigations. Finally, the irrigations are given less frequently, and fluid extract of cascara sagrada and sodium phosphate are prescribed to assist evacuation upon days on which irrigations are not used.

Marshall does not think we are yet in a position to lay down definite rules for diet in the different forms of arthritis. He advises against the use of *strong* hydrotherapeutic measures, and has not found much benefit from the use of vaccines. On the other hand, Bannatyne and Lindsay,[2] Ball,[3] and Lyon Smith[4] all report benefit from **Vaccines** in certain cases. The first-mentioned authors have found micro-organisms in the blood in two cases of rheumatoid arthritis (in one a diplococcus, in the other a micrococcus arranged in clusters), and got excellent results in both cases from the use of an autogenous vaccine. Ball considers that streptococci are often responsible for the condition. Lyon Smith (whose paper is rather unconvincing) has chiefly used organisms separated from the mouth. Goadby[5] has also published an elaborate account of his work on the association between arthritis and disease of the mouth, and reports many successes

from vaccine treatment, but his views have already been fully referred to in recent volumes of the *Annual*. *Apropos* of these results, Briscoe[6] points out that failure to find any organism in the blood, synovial fluid, or tissues around the joint does not put the bacterial view out of court, for it is now generally recognized that lesions may result from the toxins of organisms, the latter remaining at a distance and not producing septicæmia. He mentions oral sepsis, pus in the antrum of Highmore, infection of the urinary tract, and closure of a discharging sinus, as possible sources of the primary infection.

Wilson[7] records a case of rheumatoid arthritis in which great benefit was derived from the administration of **Thyroid,** but in this instance there was probably some myxœdema present as well. Macalister and others have also recommended thyroid.

Skinner[8] gives the following as the general routine treatment of a case of rheumatoid arthritis: (1) Rest in bed for at least ten hours out of the twenty-four. (2) A diet as generous as can be digested and assimilated by the individual patient, without producing putrefaction or fermentation. (3) From $\frac{1}{30}$ to $\frac{1}{40}$ gr. of **Strychnine Sulphate,** and 2 or 3 gr. of **Ferrous Iodide,** three times daily, half an hour before meals; and in emaciated cases from 1 to 4 dr. of **Cod-liver Oil,** after meals. (4) A dose of one of the various mineral waters before breakfast every two or three days, if constipation is present. (5) A body-dry **Hot Air** treatment two or three times weekly. (6) Central **Galvanization** once or twice weekly. (7) A general application of mechanical **Vibratory Stimulation** two or three times weekly. (8) A **Static Electric Application** at least once every day, consisting, in acute cases, of the Morton wave current over the affected joints or spine, and in the chronic cases of long, thick sparks to the affected joints one day and the Morton wave current localized over these joints the next. In some cases one of the high-frequency currents, applied either locally or generally, may advantageously replace some of these static applications, or be added to them. (9) A **Hot and Cold Douche** to the spine two or three times weekly. This scheme can be added to or otherwise modified, so that the emphasis of the weekly schedule can be laid upon any measure which may be indicated in a given case.

Diagnosis.—Garrod[9] considers that **Auscultation of Joints** is a valuable aid in the diagnosis of the several forms of morbid change to which they are liable. The method of examination is very simple. The only apparatus needed is an ordinary binaural stethoscope, and any difficulty which may be experienced in keeping the mouth of the stethoscope accurately applied to the changing surface of a joint in movement is easily overcome by the use of a small chest-piece, or, better still, by affixing to the chest-piece one of the indiarubber ring coverings which are sold by instrument makers. A little practice enables one to dispense with any special chest-piece. Of all joints, the knees are those which best lend themselves to such examination, and no difficulty is met with in keeping the chest-piece applied over the soft parts on either side of the patella. During the examination the joint should be slowly flexed

and extended, either by the patient himself or in a passive manner by the examiner. Auscultation of the shoulder-joint is also easy, and the sounds produced during rotary movements, as well as during elevation and depression of the arm, may be alike studied. Nor is any serious difficulty met with in the application of the method to any of the larger joints, such as the elbow, wrist, or ankle. Even small articulations, such as the temporo-maxillary or the carpo-metacarpal joint of the thumb, admit of examination with the stethoscope.

After describing some of the morbid sounds heard in the joints, he sums up by stating that this method is capable of affording early warning of troubles in articular structures, and sometimes reveals the commencement of disease in joints which to inspection and palpation appear to be normal, and which may even cause no discomfort to their possessor. Again, the method gives promise of help in the differentiation of articular diseases, and in distinguishing between those in which the cartilages and bones are implicated, and those in which the synovial membranes and soft parts around the joints alone suffer. If these claims be justified, auscultation of joints does not merely supply information which can be equally well obtained in other ways, but promises to lead to the extension of our clinical knowledge of the conditions in which it is employed.

REFERENCES.—[1]*Boston Med. and Surg. Jour.* 1910, Dec. 29; [2]*Brit. Med. Jour.* 1911, Jan. 28; [3]*Ibid.* 1911, May 13; [4]*Glasg. Med. Jour.* 1911, Mar. and Ap.; [5]*Lancet,* 1911, Mar. 11; [6]*Brit. Med. Jour.* Mar. 11, 1911; [7]*Ibid.* 1910, Dec. 3; [8]*Amer. Jour. Med. Sci.* 1910, Nov.; [9]*Lancet,* 1911, Jan. 28.

ARTHROTOMY. *Priestley Leech, M.D., F.R.C.S.*

Painter and Cornwall[1] summarize 198 cases of arthrotomy for various conditions. The mortality was a little over 2 per cent, and counting the deaths and infected joints all together as infections, there is an infection rate of 8 per cent. The later results are better than the earlier.

TECHNIQUE.—The preparation of the joint is as follows: Shave the leg and thigh with a wide margin on both sides of the joint. Scrub with green soap. Follow this with (*a*) permanganate of potash, (*b*) oxalic acid, and (*c*) corrosive sublimate, 1–3,000. Cover with a weak corrosive poultice over night, previous to operation. In the theatre the twelve hours' dressing is removed from the knee; a nurse scrubs the leg from mid-thigh to mid-calf, with soap and water for four minutes, Harrington's solution two minutes, and corrosive sublimate two minutes, after which nothing unsterilized should come in contact with the knee. A tourniquet is applied about the upper thigh.

Joint Lipomata.—The incision depends on the location of the tumour; it should be about 8 cm. in length parallel to either the outer or the inner border of patella. Skin flaps are dissected back, then flaps of fascia and adipose tissue exposing the capsule; this latter is opened longitudinally, retractors are employed to hold the cut edges apart, the attachment of lipoma is sought for, and if vascular the pedicle is tied with catgut and the lipoma removed. The bleeding points

are tied. An incision on the opposite side may be needed for thorough examination of the joint. Irrigate the joint cavity with about two quarts of hot normal saline solution or sterile water. The edges of the capsule are approximated with interrupted catgut sutures. The fascia is brought together with continuous catgut suture in a different plane. A seton drain may be left in the joint at the lower end of the incision for forty-eight hours. Care should be taken to insert nothing but the gloved finger into the joint, and if possible all manipulations should be carried out with instruments. Fifteen to twenty grains of urotropine per day should be administered for two days before the operation and for four to five days after. The patient remains in bed a week. The stitches are removed and passive movements begun on the eighth day. The arc of motion should be increased daily, and as a rule 90° may be obtained on the fourteenth day, at which time hot fomentations are ordered twice a day, with massage to the thigh and calf. When 90° of motion is obtained the patient may be allowed to bear the weight on the leg. Hydrotherapy and massage are kept up as long as is indicated. A flannel bandage is worn from the ankle to the mid-thigh for a month. Notes on fifty cases of joint lipomata are given, of which six cases were infected. They regard it as a mistake to operate on both knee joints at the same sitting.

Erasion and Excision.—In excision for *tuberculous disease*, Painter and Cornwall use the usual U-shaped incision, divide the patellar tendon below its mid-point, and divide the crucial ligaments. They unite the divided joint surfaces by catgut through holes drilled in the bone. In their opinion the operation of erasion is not to be compared in its beneficial effects with excision. Some surgeons are employing arthroplasty, after the method of Murphy, in tuberculous cases, but the results in their opinion are not sufficiently satisfactory to justify its use. The transplantation of an entire joint may in the future yield better results. *For removal of a semilunar cartilage* they recommend R. Jones's incision. Make a straight skin incision with its centre over the joint, and then flex the leg over the end of a table, when the cartilage will at once present. The capsule is then incised. The removal of the detached portion should be done with a tenotome or a long-handled, short-bladed pair of scissors; nothing but instruments need ever enter the joint cavity. The capsule should be closed carefully and by a separate row of catgut sutures, which should be sufficiently resistant to digestion for at least three weeks. Close the fibrous capsule with a continuous catgut. If there is much oozing, use a seton drain and interrupted sutures. No splint is used; passive movement is begun after eight days. A bandage should be worn for six weeks or a month.

Joint "Mice."—These can be removed in the same way, but sometimes they are in the posterior part of the joint, and may then be reached by an incision in the popliteal space. It is not safe to attempt their removal under local anæsthesia.

In their experience, displaced internal cartilages are much more

frequent than displaced external cartilages; they also say that the semilunar displacements are accompanied by hypertrophy of the alar ligament nearest to the dislocated cartilage, and it may be advisable to remove this at the same time.

Avoid operative interference in cases of joint "mice" and displaced cartilages until after a few days' rest of the joint, so as to give time for the traumatic exudate to be absorbed.

Villous Arthritis; Infectious Arthritis.—The technique is the same. They have often employed two straight incisions on either side of the patella. With scissors the large fringes and villous enlargement are removed. The bases of these fringes cicatrize, and the synovial membrane grows over the base. The joints should be washed out with hot sterile solution, and drained for forty-eight hours with a seton drain. Early manipulative treatment should be the rule. The therapeutic conditions met by arthrotomy in these cases are: (*a*) removal of toxins which if allowed to remain would damage the joint; (*b*) removal of the products of previous inflammatory conditions even when they are not capable of exerting any toxic influence on the joint; (*c*) removal of fringes whose presence in the joint is a mechanical irritant preventing the restoration of the synovia to a normal condition. The growth of a pannus over the margins of the articular cartilage should be removed when seen in an arthrotomy, for its persistence invariably means cartilaginous erosion. Massage has to be used carefully in these cases, particularly where the infection has been a recent one. Physical therapy, principally in the form of stimulating douching with hot and cold water, protective splinting to guard against overstrain, and bandages to keep down swelling and control the extremes of motion, are indicated.

The authors tried the injection of sterile oil to preserve motion in the joint after arthrotomy, but they were unable to satisfy themselves that it exercised any influence in this direction.

REFERENCE.—[1]*Boston Med. & Surg. Jour.* 1910, Oct. 20, *et seq.*

ASTHMA. *J. J. Perkins, M.B., F.R.C.P.*

Goldschmidt,[1] summing up his experience of the drug treatment of asthma, finds, for the severe attacks, nothing to equal **Morphia** with a small quantity of **Atropine.** Of **Adrenalin,** he can find but little to say, as its use at the hands of the profession has been limited by the fear of setting up arteriosclerosis. At the very beginning of an attack, he finds preparations of **Theobromine**, and especially **Diuretin,** effectual, and gives the following formula:—

℞ Caffein. Valerian.	0·25 gram (about 4 grains)	Theobrom. Sod.-salicyl.	0·5 gram (about 8 grains)

M. ft. pulv. 1 or 2 to be taken at the commencement of an attack.

If the asthmatic attack is followed by bronchial catarrh, the preparations of iodine are of most service, the **Iodides of Potassium, Ammonium,** and **Sodium** being all in use. **Iodipin,** however, cannot be employed because of its tendency to bring on spasmodic cough.

Pyrenol, recommended by some as a valuable expectorant, does not, in his opinion, replace the iodides.

For the continuous treatment of the asthmatic, von Noorden and Terray have had recourse to the old French method of the use of **Atropine Sulphate.** Apart, however, from its poisonous properties, it has seemed to Goldschmidt to have no lasting effect when given subcutaneously. A much wider field is open for atropine in the form of nasal inhalations, though he prefers, even here, the use of **Eumydrin** (methyl atropine nitrate), which he combines with **Alypin** in the place of cocaine, giving the following formula for a nasal spray :—

R	Alypin. Nitrat. 0·3 gram (about 5 grains)	Aq. Dest.	25 c.c. (about 6 drachms)
	Eumydrin. Nitrat. 0·15 gram (about 2 grains)	Ol. Pin. Pumil.	gtt. 1
	Glycerin. 7 grams (about $1\frac{3}{4}$ drachms)		

For use with a nebulizer.

Alypin causes a slight hyperæmia of the nasal mucosa, so that the patient should be advised to add 8 to 10 drops of **Adrenalin,** 1–1000 to each 10 c.c. of the above formula. This must be done at the time, as suprarenal preparations are so liable to decompose ; the formula given is not only very useful, but cheap.

Friedeberg[2] corroborates Goldschmidt's recommendation of eumydrin on account of its non-poisonous qualities. He insists that the nebulizer must deliver a very fine spray, and prefers the glaseptic-nebulizer of Parke Davis. In some fifteen cases, partly of severe asthma of long standing, he has seen excellent results without any disagreeable consequences, and it is quite capable of aborting a threatened attack.

Giffin[3] reports the results of the treatment of asthma by **Nasal Operation,** based on 66 cases. In 35 cases turbinectomy was done, in 12 polypi were removed, in 9 the antrum was drained, and in 6 septal deformities were corrected.

Reports have been received from 52 patients, nine months to one and a half years after operation. Two only are worse than before operation ; 13 can see no definite change in their condition ; while 30 are definitely much improved, both as to frequency and severity of attack. Five consider themselves cured, one of whom had suffered for twenty years and another for sixteen. Of these five, 4 had turbinectomy done, and 1 the removal of polypi. To sum up, definite improvement was obtained in 57 per cent, and cures in about 10 per cent of the cases.

Oxygen is well spoken of by Schmidt and David (*page* 29), and **Yasotonin** is recommended by Müller and Fellner (*page* 64).

References.—[1]*Münch. med. Woch.* 1910, Oct. 25 ; [2]*Deut. med. Woch.* 1911, Feb. 9 ; [3]*Boston Med. and Surg. Jour.* 1911, Feb. 16.

ASTIGMATISM. (*See* Refraction, Errors of.)

ATROPHIC RHINITIS. (*See* Nose, Diseases of.)

BANTI'S DISEASE.

Vol. 1911, *pp.* 582, 583)—In the early stages **Splenectomy** may effect a cure.

BELLADONNA ERUPTIONS. *E. Graham Little, M.D., F.R.C.P.*

The eruption most frequently seen in belladonna poisoning, according to Knowles,[1] is an erythema resembling scarlatina. This may come on within fifteen minutes of taking the drug, and may persist for twenty-four hours or more. Absorption may also take place from a belladonna plaster, or from eyedrops, ointments, lotions, liniments, etc., and cause the same symptoms. Poisoning with the drug may take place without an eruption appearing. In addition, or without this general intoxication-rash, there may be local eruptions, due to actual contact, which are indistinguishable from acute vesicular eczema. There may be a remarkable idiosyncrasy to the drug, as in a case quoted by the author, in which repetitions of the eruption were induced at will by repetition of contact. The skin need not be abraded for absorption to take place. The eruption may be petechial, and gangrene may result; general exfoliation may take place following œdema. The erythema may be almost urticarial in aspect, with raised and discrete patches.

In addition to the skin symptoms, there is usually evidence of poisoning in incoherence of speech, rigidity of the limbs, giddiness, twitching, delirium and cerebral excitement, increased frequency of micturition, rapid pulse, hurried breathing. The pupils are usually dilated, but not always so. The prognosis is favourable, only one death being reported in the large series examined.

Reference.—[1]*Amer. Jour. Med. Sci.* 1911, ii, 73.

BERI-BERI. *Leonard Rogers, M.D., F.R.C.P.*

Etiology.—Henry Fraser and A. T. Stanton[1] record further researches. They had previously shown that the disease is closely associated with the consumption of polished rice, which has had all the outer coatings, containing the nitrogenous and phosphorous compounds, removed in the process of preparation. When fowls are fed on it they lose weight and develop polyneuritis, but if the polishings are added to the food after the symptoms have begun to develop, the disease is checked and recovery takes place. The present experiments were directed to ascertain the particular constituent of the polishings which is essential to maintain the health of consumers of rice. They show that fat-free portions maintain health, so the fatty parts are not essential. Similarly, although the amount of phosphorus in a sample is a measure of its nutritive value, still the phytin, which contains 73 per cent of the phosphorus, is not in itself necessary for maintaining health. On the other hand, the important material resides in a 95 per cent alcoholic extract of the materials of the polishings which are dissolved out by treating with 0·3 per cent HCl, which forms only 1·6 per cent of the polishings. The precise nature of this important constituent has not yet been ascertained.

Victor G. Heiser[2] records important practical results of the application of the discovery of the relationship of polished rice to beri-beri in the Philippine Islands, where the work in the Malay Straits was soon confirmed by the investigations of Foster and Aron. Beri-beri had been commonly present in the Culion leper-colony since its opening in 1906, over one-third of the deaths in a recent twelve months having been due to this disease. After the use of unpolished rice was made compulsory, no deaths occurred from beri-beri, and the total death-rate was reduced by nearly one-half. Moreover, the addition of rice polishings in the treatment of cases was followed by rapid cure within a few weeks. In May, 1910, the use of polished rice was prohibited in all civil public institutions by the Government, since which only two cases of beri-beri have occurred in them, and in both of these the regulation had not been strictly carried out. The disease has only been found where polished rice forms the staple diet, the addition of meat and potatoes sufficing to prevent it. The people objected to unpolished rice because it contained husks, but this was surmounted by teaching the rice mills to avoid this defect. A bill to place a tax on all polished rice is under consideration. This serious disease may now be added to those which have been overcome by recent scientific investigation.

REFERENCES.—[1]*Lancet* 1910, ii, 1755; [2]*Jour. Amer. Med. Assoc.* 1911, i, 1237.

BILHARZIASIS. (*See* SCHISTOSOMIASIS.)

BILIARY TRACT. (*See* GALL-BLADDER.)

BLADDER, SURGERY OF. *J. W. Thomson Walker, M.B., F.R.C.S.*

Ectopia Vesicæ.—It has always been the subject of comment that the ectopic bladder, exposed as it is to the friction of clothes and dressings, and subject to chronic inflammation from constantly recurring infection by bacteria, is rarely the seat of new growth. August Hager,[1] working in Professor Chiari's laboratory in Strassburg, has described a case of adeno-carcinoma which developed in the ectopic bladder of a labourer aged sixty-six years. The exposed mucous membrane was the seat of a cauliflower-like new growth, but the ureteric orifices were unaffected. The ureters and kidneys, as commonly happens in ectopia vesicæ, were greatly dilated. Microscopically the growth consisted of cylindrical epithelium, and there were structures resembling Lieberkühn's follicles. Hager takes the opportunity to discuss the cause of ectopia and the origin of the cylindrical epithelium. He agrees with the view of Enderlen that the malformation results from an abnormally extensive destruction of the cloacal membrane, the openings which form in this membrane being normally confined to the urethral and vulvar openings and the anal opening. The origin of the cylindrical epithelium may be ascribed to the normal glands of the bladder fundus, to the transformation of the epithelium under the influence of inflammation, to an error in

development of the epithelium, or to misplaced fragments of prostatic gland tissue. Hager looks upon the second of these views as correct.

Wounds.—Wolfer[2] has reviewed the subject of *accidental penetrating wounds* of the bladder, excluding those produced in war, in surgical operations, or resulting from childbirth. In fifty-four out of sixty-seven cases the wound was perineal, the remainder resulting from suprapubic, inguinal, or gluteal wounds. The important symptoms are hæmaturia or retention, with urgent desire to micturate. Leakage of urine from the wound was occasionally observed, and dullness on percussion of the lower abdomen was rare. The general symptoms are of no value in diagnosis. The important question whether the wound is extraperitoneal can only be ascertained by operation. The prognosis depends upon the nature of the complications. In forty-nine cases of extraperitoneal injury, six were fatal, and in eighteen cases of intraperitoneal injury, nine were fatal.

Drainage of the Urine is the most important principle of treatment. This is met, according to the author, by permanent catheterization for days or weeks, or in some cases by intermittent catheterization. **Laparotomy** should be done in all intraperitoneal and doubtful cases.

[Although a large number of extraperitoneal and a few intraperitoneal wounds heal under catheter drainage, the difficulty in distinguishing between these varieties is so great, even with the help of the cystoscope, that in all cases the bolder plan of opening the baldder suprapubically, and making a thorough examination is the wiser.—J. W. T. W.]

Atony.—Thomson Walker[3] has described a group of cases, hitherto unrecognized, in which there is *atony of the bladder without obstruction or signs of nervous disease.* For clinical purposes, he says, cases of atony of the bladder have hitherto been arranged in two well-defined groups: those in which organic disease of the spinal cord is present, and those in which it results from obstruction to the outflow, as in enlarged prostate and stricture. The cases he describes belong to neither group. Twelve cases are given in detail, the chief characteristics of which are as follows: The symptoms commence in most cases under thirty years, and there may be no venereal history. There is increasing difficulty in passing water, which may eventually become complete retention and necessitate constant catheterization. Usually there are from ten to twelve ounces of residual urine. In some cases the sensibility of the bladder is diminished, but occasionally there is irritability without cystitis. The wall is trabeculated in all cases. This the author considers due to atrophy of the intervening muscle bundles, which gives different cystoscopic appearances (*see Plate V, Figs. A, C*) from those of hypertrophy. Great care is necessary to distinguish these cases from those of slight intravesical enlargement of the prostate, atrophy of the prostate, or fibrous contracture of the neck of the bladder, and also from early and irregular cases of tabes. A very thorough examination of the nervous system, including the spinal fluid, is necessary. Further, the duration of the atony for fourteen and eighteen years, without development of symptoms of organic

PLATE V.

CYSTOSCOPIC APPEARANCES OF CASES OF HYPERTROPHY, ATROPHY, AND RECURRENT PAPILLOMA OF THE BLADDER

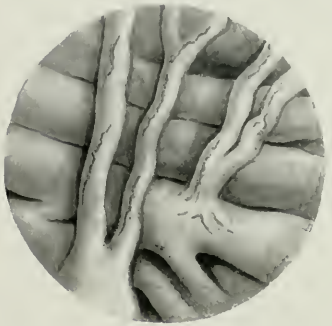


Fig. A.—Trabeculation due to hypertrophy (case of enlarged prostate).

Fig. B.—Recurrent papillomata on scar of previous operation. The ureteric orifice is seen in the scar.

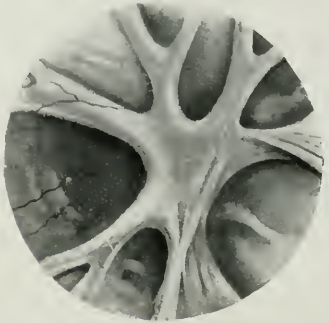


Fig. C.—Trabeculation due to atrophy.

J. W. Thomson Walker

nervous disease, showed that this could be excluded. The author believes that the atony is due to disease of the hypogastric and hæmorrhoidal plexuses of the sympathetic, which are the lowest reflex centres of the bladder.

Ware[4] has revived the subject of *non-prostatic urinary retention of the senile bladder*, so well known under the name of "prostatisme sans prostate," or "prostatisme senile," given by Guyon in 1899. In these cases there is retention of urine in old men without prostatic obstruction. This was ascribed by Guyon to a process of sclerosis and fatty degeneration incident to old age, and affecting the bladder together with other organs. This statement led to the view of Guyon and Thompson that atony of the bladder was irreparable when combined with enlarged prostate, a view which has been shown by the results of prostatectomy to be completely erroneous. Albarran attributes the retention in these cases to "inhibition." Ware holds that the fundamental cause remains undetermined.

Miller[5] believes that much can be done to reduce the quantity of *residual urine in prostatic enlargement* by constant effort to train the bladder to empty itself completely. He believes that some part at least of residual urine accumulates from insensibility of the bladder and carelessness of the patient, and he recommends that in such cases, after micturition has finished, a renewed effort should be made to get rid of the residual urine. After a time, success attends these efforts.

Tumours—Tennant,[6] after an experience of two cases, and Seton Pringle,[7] of one, are enthusiastic advocates of what has been termed **Intraperitoneal** or **Transperitoneal Cystotomy** for the operative treatment of tumours of the bladder. The method consists in placing the patient in the Trendelenburg position, and opening the peritoneum by a median incision extending from the symphysis pubis to the umbilicus. The bowel is packed off, and the peritoneal surface of the bladder incised and completely closed when the growth is removed. The advantages that Tennant claims for the method are that "urinary infiltration into the muscle planes" of the abdominal wall is avoided, and "the high mortality, no doubt partially due to the urinary absorption," is reduced. This author also holds the view that the results of the removal of growths are likely to be better by this method. Pringle states that by the usual extraperitoneal suprapubic route it is difficult to obtain a proper view of the growth; the hæmorrhage is difficult to control and further obscures the view; it is almost impossible to define the limits of malignant growths; and there is great difficulty in dealing with the ureter if the orifice is involved. This method is also recommended by Scudder.[8]

These views will not receive support from most surgeons practised in bladder surgery. Urinary infiltration of muscle planes with increase of mortality is a myth. The chief difficulty in exposure is not the peritoneum, which can be stripped off the bladder and packed back without opening it, but the recti muscles on either side. It is certainly

necessary to open the peritoneum for the purpose of defining the limits of a growth seated on the posterior wall of the bladder, and it is frequently necessary also to remove the peritoneum with the growth, but this is merely an extension of the ordinary suprapubic operation. When the growth is seated at the base, all the necessary manipulations for an extensive resection of the bladder wall and transplantation of the ureter can be carried out without opening the peritoneum.

According to Thomson Walker,[9] the two most important causes of recurrence of simple *papilloma* of the bladder after operation are: (1) Overlooking of small papillomata and incomplete removal of the tumours; (2) The implantation of fresh papillomata during the operation. Thus it is found on cystoscopic examination after operations for the removal of papilloma that papillomata have been overlooked, and also that small buds are present at the edge of the operation scar within a few weeks or months of the operation (*Plate V, Fig. B*);

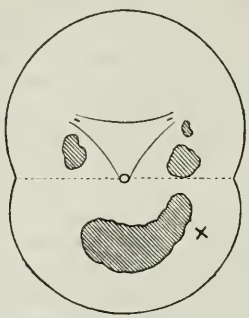


Fig. 37.—Cystoscopic chart ofrecurrent papillomata. The largest lay on the old cystotomy scar. At × a small bud of papilloma was hidden from view and discovered at operation.

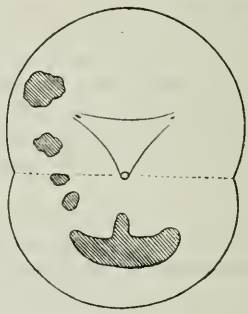


Fig. 38.—Cystoscopic chart of recurrent papillomata. Local recurrence outside right ureteric orifice and a trail to the cystotomy wound, on the scar of which the largest mass is situated.

further, that there is a track of papillomatous tumours from the original site to the scar of the cystotomy wound; finally, that the largest of the "recurrent" growths is found in the site of the cystotomy wound (*Figs.* 37, 38).

To remedy these defects the writer proposes:

1. Pre-operative cystoscopy and charting of papillomata in order to ascertain the exact number, size, and position of all the growths (*Figs.* 37, 38). This is easily done by cystoscopy, but is difficult after opening otherwise normal bladders, and impossible when cystitis is present. The chart is before the surgeon during the operation, and each growth is accounted for.

2. The proper exposure of the growth. This is obtained by the median suprapubic extraperitoneal route, by the Trendelenburg position, and by the use of special bladder retractors.

3. Removal of the papillomata, together with the mucous membrane

on which they are set (*Figs.* 39, 40). In some cases long strips and large areas over which papillomata are scattered are removed. The edges of the mucous membrane are carefully sutured with the assistance of long needles with pliable handles.

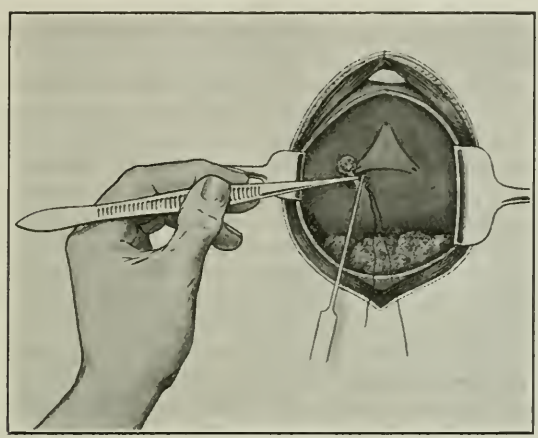


Fig. 39.—Removal of a solitary pedunculated papilloma. A thread of catgut is being passed through the base of the pedicle.

4. After removal of the growth the whole vesical mucous membrane is treated with strong solution of silver nitrate (20 to 30 gr. to the ounce), formalin (1-300), or other solutions which coagulate

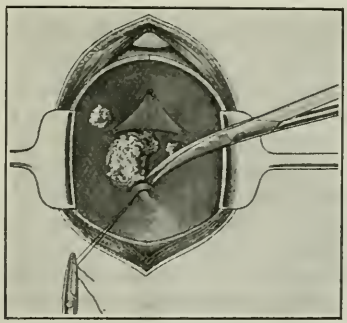


Fig. 40.—Removal of papilloma with extensive base. A fine catgut suture has been introduced above the growth, and the ridge thus raised cut across, and the incision carried round the growth in healthy mucous membrane.

albumin, with the object of destroying microscopic papillomata which may have escaped observation, and also of killing tiny fragments of papilloma which may have been implanted during the operation.

Hagner[10] suggests that in removing *growths at the fundus* of the bladder, the cystoscope should be introduced and the bladder exposed suprapubically, and sutures placed through the bladder wall around the growths under guidance of the eye applied to the cystoscope. The tumour is then removed in the usual way. [The weak point in this operation is the fact that in many cases the lateral extent of the growth is principally intramuscular, and therefore palpable but not visible.—J. W. T. W.].

Binney[11] discusses at length the present status of *intravesical operations for tumours of the bladder*. The operating cystoscope by which these are performed was introduced by Nitze, and recently instruments have been introduced by Luys and Kiersmaecker. The method has been used by a large number of surgeons, who claim the following advantages for it: (1) Small mortality. Weinrich found one death in 150 cases, whereas von Frisch reported 14 per cent mortality in 300 cases of suprapubic operations; (2) The avoidance of complications such as fistula, sepsis, phlebitis, or pneumonia, involving long convalescence; (3) The ability of the patient to continue work; (4) More thorough inspection permitted, and less danger of overlooking small tumours; (5) The avoidance of danger of implanting tumour cells in other portions of the bladder or in the suprapubic scar; (6) Greater applicability to recurrent tumours.

In answer to these claims of superiority for the intravesical method, the following may be urged: (1) The mortality of suprapubic operations upon the same growths that are subjected to this method is nil in the hands of a competent surgeon; (2) Such complications as fistula, etc., should not occur; (3) The presence of a papilloma of the bladder is sufficiently serious for the patient to devote time for its thorough removal; (4) and (5) Pre-operative cystoscopy, charting of papillomata, etc., as advocated above; (6) Recurrent growths are malignant, or about to become malignant, and should be treated as such.

Beer[12] claims to have treated successfully five cases of primary *papillary tumours* of the bladder by means of the **Oudin High-frequency Current.** The essential instruments are: (1) A high-frequency machine with Oudin resonator; (2) A catheterizing cystoscope; (3) A heavily insulated copper electrode. The bladder is washed and distended with distilled water and the cystoscope introduced. The electrode is pushed a short distance in against the villi, and the current allowed to play fifteen to thirty seconds at each application, a total of three to five minutes at one sitting usually sufficing. The sloughs are allowed to separate spontaneously, and the bladder is irrigated. One patient died, probably from embolus, and there is also a danger of burning the bladder wall.

Bangs[13] recommends the use of **Creolin** as a means of controlling the *hæmorrhage from inoperable neoplasms* of the bladder. Solutions of ¼ to 1 per cent were used at a temperature which was gradually raised from 100° F. to 104° or 105° F. About 2 oz. of the creolin solution

were introduced into the bladder and retained for twenty or thirty minutes. The treatment was repeated daily at first, and then at longer intervals.

Drainage.—Fuller[14] describes a new method of draining of the bladder, which he terms *post-prostatic cystotomy*. The ordinary perineal cystotomy opens the urethra at the apex of the prostate and drains the bladder through the prostatic urethra. Fuller dissects behind the prostate and seminal vesicles between these organs and the rectum, and opens and drains the bladder in the middle line behind the seminal vesicles. The advantages claimed for this method are that the drainage is better than that of the usual perineal operation, and that the irritation of draining through the prostatic urethra is avoided.

According to the author, the operation is specially applicable to cases of cystitis secondary to seminal vesiculitis and tuberculous cystitis.

REFERENCES.—[1]*Münch. med. Woch.* 1910, 2301; [2]*Beitr. z. klin. Chir.* lxvi, Pt. 2, in *Ther. Gaz.* 1910, Dec. 15; [3]*Ann. Surg.* 1910, 577; [4]*Ibid.* 1911, 57; [5]*Edin. Med. Jour.* 1911, i, 254; *Pract.* 1911, 293; [6]*Ann. Surg.* 1910, 657; [7]*Lancet*, 1911, i, 214; [8]*Bost. Med. and Surg. Jour.* Feb. 16, 1911; [9]*Lancet*, 1910, ii, 1409; [10]*Ann. Surg.* 1910, 654; [11]*Bost. Med. and Surg. Jour.* 1911, i, 226; [12]*Ann. Surg.* 1911, 208; [13]*Med. Rec.* 1911, i, 359; [14]*Med. Rec.* 1910, ii, 701.

BLOOD, EXAMINATION OF.

O. C. Gruner, M.D.

Leucocytes.—The investigation of the white cells in ordinary medical and surgical practice still receives a large share of attention, and the results obtained are very fruitful, although not sufficiently recognized. It is important to consider not only the number, but also the variety of cells which are present; and it is especially noteworthy that the variations in the characters of the polynuclear leucocytes are of real importance. Furthermore, the systematic study of the white cells in cases of **Leucocytosis** would enable a chart to be constructed on the lines of a temperature chart, giving solely the number of white cells (morning and evening, or once daily). This might be a better guide to the surgeon or physician than the temperature and the pulse. The variations would be indications of the degree of virulence of infection as well as of the toxicity of products. We should know the daily variations of the resisting power of the patient, and thus get a better idea of the outlook to be expected, as well as of the value of the treatment. While it is found, on the one hand, that the leucocytic curve varies with age and sex and in different individuals, it is found on the other hand that an initial leucocytosis occurs apart from such variations, and that later on in the disease variations in the cell-count may be looked upon as definitely due to the disease and not to the individual peculiarities of the patient.

Taking the detailed variations among the leucocytes, the first that comes under consideration is that pointed out by Arneth. Everything depends on the fact that the differential count of the cells remains constant in health, at any rate within reasonable variational limits. In severe infections, the picture is "moved to the left," as it is called, which means that the number of senile leucocytes is

diminished, owing to the preponderance of new young cells thrown into the circulation to cope with the infection. On the other hand, in the cases, for instance, of severe septic peritonitis, the senile forms increase in number, because the leucocytes are so rapidly used up and destroyed that the bone marrow is not able to replace them in time. Sonnenburg[1] strongly supports the practical value of this method of classification, and points out that the only trouble is that of teaching the observers how to differentiate the cells; at the same time he remarks that it is not as troublesome as performing an opsonic estimation. He however adopted a simpler method than that recommended by Arneth in that he grouped all myelocytes together, which is certainly justifiable in the light of our own experience. We have the following: iso-hyper-leucocytosis, increased number of leucocytes, in which varieties remain normal in relation; aniso-hyper-leucocytosis, leucocytosis in which the young cells are more numerous; aniso-hypo-leucocytosis, where the young cells are relatively more numerous but the total numbers are diminished; and normo-leucocytosis, normal number of white cells.

It is perhaps in the case of **Appendicitis** that the value of frequent counts becomes noticeable. The rise in the cell-count comes on the more rapidly and markedly the more severe the degree of inflammation, the greater the toxicity of the exciting organisms, and the more rapidly the peritoneum is involved. In this case it is noticeable that the differential count is not necessary before an operation is undertaken, the quantitative count being a sufficient guide, and feasible within a few minutes after admission of the patient. Should clinical indications point to a rapid operation, the detailed blood-picture may be studied after the operation, and the future line of treatment based upon the findings at that time. When we consider how closely appendicitis may be simulated by several conditions, such as strangulation, simple colitis, gall-stones, typhoid, in each of which an entirely different blood-picture is obtained, it requires very little more persuasion to induce the practitioner to adopt this method of diagnosis. The whole process can be done in half an hour when the details are reduced to absolute necessities. With a suitably equipped white-cell-count case, three minutes will suffice to make the dilution; the stained preparation can be proceeded with, and when finished it will be time to discharge a drop of the diluted blood on the counting-chamber; a survey of one or two fields will suffice to tell whether there are eight or ten or twenty or forty thousand corpuscles per cubic millimeter.

In *infectious diseases*, the more severe the infection the greater the leucocytosis, especially if the poison is hæmolytic; this is especially noticed in diseases due to streptococci, where the red cells are greatly diminished in number by direct hæmolytic action, as for instance in **Puerperal Fever,** where they may fall to a quarter of their original number within a few days. In **Enteric Fever,** on the other hand, there is no genuine deleterious action on the red cells. A number of febrile diseases, again, run their course without any associated

leucocytosis. **Measles** is the most striking example in clinical pathology. In **Influenza,** too, the spleen is very large, and yet there is no leucocytosis. A small central **Pneumonia** may fail to produce leucocytosis, showing that absence of this sign does not *ipso facto* exclude certain conditions. In **Banti's Disease** a hypoleucocytosis is conspicuous.

In *gynæcology*, according to Franz,[2] leucocytic counts have much less diagnostic or prognostic value, and he states that this is due to the peculiar circumstances of the diseased area. For one thing, as he admits, operative interference is the rule, and justified by experience, so that a blood examination is more or less a waste of time. He advises the adoption of clinical data for prognosis and treatment entirely. In this connection it requires to be pointed out that the appearance of leucocytosis does not necessarily mean pus, but may occur when there is only incipient pus formation. Kownazeki (quoted in the same article) gives the following rules for diagnosis and prognosis in **Puerperal Fever:** Normal proportion of polynuclears with presence of eosinophiles—good prognosis. Leucocytosis of 50,000, with degeneration of polynuclears, absence of eosinophiles, and red-celled anæmia —bad prognosis. Improvement of the white-cell picture, the appearance or increase of eosinophiles—improvement in outlook; and vice versa. Poikilocytosis with polychromasia and nucleated reds indicates a very bad prognosis.

In concluding this review of inflammatory leucocytosis, reference may be made to some of the details of *Arneth's doctrine of leucocyte counts*. An exhaustive study by Schilling-Torgau[3] gives some valuable conclusions. In the first place, the *technique* consists in staining the blood films with Pappenheim's method of combined May-Grünwald and Giemsa. Fix the air-dried film with May-Grünwald solution; three minutes. Pour on an equal quantity of water (distilled). Leave one minute. Rinse briefly. Pour on diluted Giemsa (10 drops of stock Giemsa to 10 c.c. distilled water) and leave 15 minutes or more. Carefully rinse in distilled water. Blot with fluffless blotting-paper, and dry. The film is now studied, and the various cells are marked off as they are passed before the eye (oil-immersion lens essential), using the following classification: (1) Segmented-nucleate polynuclears; (2) Rod-nucleate polynuclears; (3) Juvenile polynuclears; (4) Myelocytes; (5) Large mononuclears; (6) Lymphocytes; (7) Basophile cells (mast cells); (8) Eosinophile cells.

In the differentiation of the last four there is no difficulty. The so-called transitional cells and the "hyaline" cells are grouped as large mononuclears. It is only necessary to define the first four. The *segmented-nucleate* polynuclears are those which have two, three, four or more separate clumps of nuclear matter, united or not by threads; in other words, they are the polynuclears which are known as such by the non-specializing clinician. The *rod-nucleate* forms are those which possess a ribbon-like nucleus, without any special nodosities. The *juvenile* forms possess an S-shaped nucleus which has the ends of the S thickened; some forms possess a reniform nucleus, the indentation

being conspicuously deep. The *myelocytes* are similar cells to the latter, though a little larger, have a slightly indented nucleus, and at first sight appear like the mononuclear leucocyte. The differences lie in the presence of granules in the myelocyte plasma, and the presence of a nucleolus (sometimes more than one). With these few headings a careful differential count becomes easy, and according to the author quoted serves all the purposes for which Arneth's classification was intended. That is to say, the classification given is less complicated than that of Arneth, but gives as good results in practice.

The deductions to be made are that if the "picture" is displaced to the left, there is regeneration of leucocytes (neutrophiles); if to the right, the neutrophiles are degenerating. Extreme displacement to the left indicates hyperplasia in the bone-marrow. We have the following groups: (1) No change in blood-picture: aplastic anæmia, chlorosis, pernicious anæmia (occasionally), pseudoleukæmia (usually), splenic new growths, ordinary tumours, chronic protozoal disease. (2) To the right: most acute infectious diseases, especially typhoid, pure tuberculosis, lues. (3) To the left: septic diseases (puerperal fever, appendicitis, peritonitis, septicæmias, mixed infections in tuberculosis), scarlet fever, diphtheria, new growths, pneumonia, acute protozoal diseases. (4) Extreme displacement to left: agonal septicæmia, leukæmias.

Schilling points out further that the method serves as a good indicator for therapeutic measures such as operations, use of serum treatment, use of *x*-rays; that it serves for warning against relapses or against retrogression in the condition of the patient; or, finally, for controlling the use of such an agent as tuberculin. In other words, "a neglect of Arneth's method, on the lines indicated, in the investigation of the leucocytes clinically, is a technical error."

To present a more concrete impression of the applicability of the method, the following records may be appended, selected from the contribution already discussed.

Disease.	No. of white cells per c.mm (in thousands).	Basophiles.	Eosinophiles.	Neutrophiles.				Lymphocytes.	Large Mononuclears.
				Myelocyte.	Juvenile.	Rod-nucleate.	Segment'd nucleate.		
Normal	6	1	3	—	—	4	63	23	6
Typhoid fever	3	—	—	—	—	**30**	19	**36**	**15**
Severe sepsis	7	—	—	**1**	**12**	**49**	25	**9**	**4**
Liver abscess	6	1	2	—	—	**27**	42	20	8
Ankylostomiasis	6·5	2	**32**	—	—	4	32	22	8
Leukæmia	50	**3**	**6**	**14**	**13**	**20**	36	**3**	**5**
Lymphatic leukæmia ..	120	—	1	—	—	2	1	**55**	**41**
Aplastic anæmia	3	1	2	—	—	**5**	62	23	6
Hodgkin's disease ..	5·7	1	1	—	—	7	40	**45**	8

The figures in thick type indicate how the "picture" is deviated in one direction or the other.

Thus, the youngest type of polynuclear leucocyte in normal blood is the rod-nucleate form. In typhoid fever the picture is deviated to the left (great increase in rod-nucleate forms, diminished segmented nucleate forms). In severe sepsis there is marked deviation to the left (black figures in first two columns of neutrophiles, with still higher

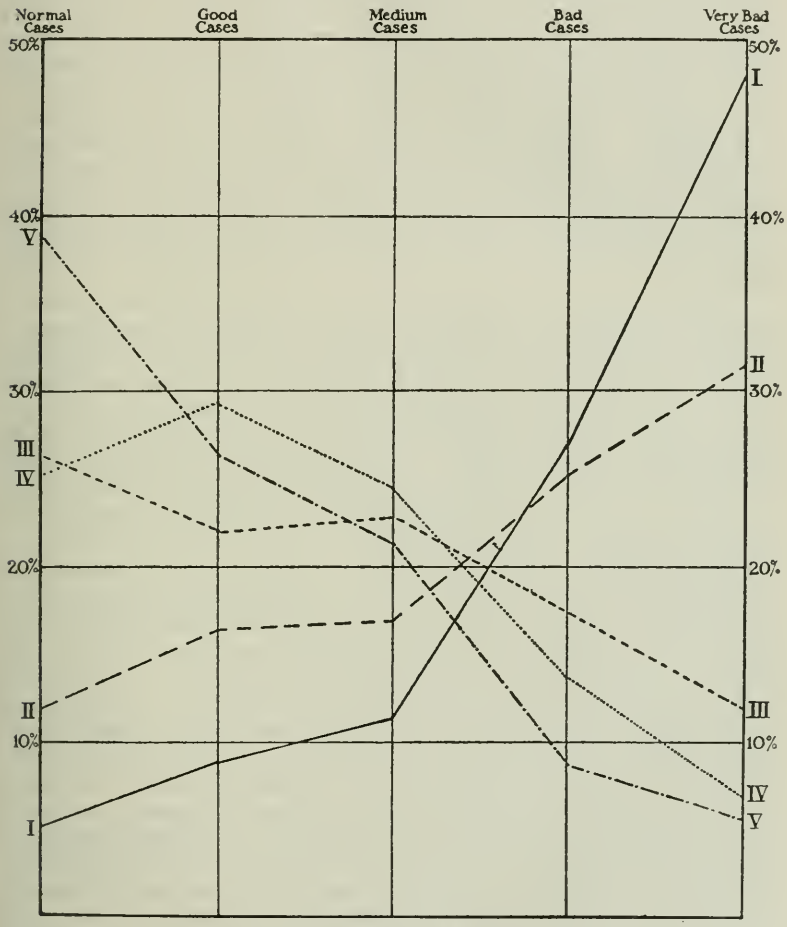


Fig 41.—Graphic illustration of Arneth's method.

percentage of rod-nucleates). Similarly with leukæmia. On the other hand, in lymphatic leukæmia the picture is deviated to the right, the chief figures being in the lymphocyte and large mononuclear columns. The aplastic anæmia shows no deviation. Note the high and low values marked in thick type in the other cell-columns, which draw

attention to lymphocytosis, lymphopenia, eosinophilia, large mononucliosis in the different diseases.

Some work on this subject carried on by Minor and Ringer[4] furnishes interesting results which, though not giving exactly the same figures as those of Arneth, nevertheless point in a similar direction. A good idea of the real usefulness of this method of study is shown by the chart given (*Fig.* 41), where the cases are divided into normal, good, medium, bad, and very bad (from the prognostic standpoint). The figure (*I*) indicates cells with only one nucleus or two lobes joined by an isthmus; (*II*) Double nuclei connected by only a thread; (*III*) Three segments; (*IV*) Four segments; (*V*) More than four segments. The increase of Class *I* cells in the very bad cases is shown in a striking way. An example is given in which a patient suffering from tuberculosis seemed to be doing well, but showed a count of 20–45–30–5–0. This count could not be explained until, a few days afterwards, the illness relapsed, spread rapidly, and ended fatally.

The Eosinophiles.—The value of determining the number of eosinophiles in the blood is enhanced by the method of counting them introduced by Dunger[5]. Galambos[6] examined a number of cases by this method, and found with Nägeli that an absence of eosinophile cells with simultaneous leucopenia and relative lymphocytosis is so characteristic of **Typhoid Fever** that unless these phenomena are noted a diagnosis should not be made. On the other hand, during the convalescence from typhoid, eosinophiles steadily increase until they reach a number in excess of normal. The latter phenomenon may thus be used as a prognostic sign in typhoid.

Blood Platelets.—A new method of counting blood platelets is published by Wright and Kinnicutt.[7] An ordinary red-cell pipette is used, and the blood is diluted with a freshly made mixture of two parts of 1–300 aqueous brilliant cresyl-blue and three parts of an aqueous 1–1400 potassium cyanide. The mixture of blood with this fluid in the pipette is afterwards used to place in an ordinary counting-chamber, using a thin cover-glass. In 10 or 15 minutes the platelets can be counted, because they are clearly outlined and are lilac in colour. It will be sufficient to count 100 small squares. Normally there are 226 to 367 thousand per c.c. In **Pernicious Anæmia,** nine cases showed a diminution of from 20 to 161 thousand; in **Secondary Anæmia,** an increase from 400–1162 thousand. This difference is explained by the absence of hyperplasia of the red marrow in pernicious anæmia, so that there are fewer giant cells (megacaryocytes) which give rise to blood platelets by fragmentation of their cytoplasm.

Other conditions in which the platelet count is *diminished* are: **Splenic Anæmia, Hæmophilia, Malaria, Lymphatic Leukæmia,** the commencement of **Typhoid** and **Pneumonia,** and **Ulcerative Colitis.** The count is *normal* in **Chlorosis, Myeloid Leukæmia,** and some cases of **Hæmophilia.** It is *increased* in the convalescence from **Pneumonia** and **Typhoid,** in **Empyema, Acute Rheumatism, Septicæmia, Hodgkin's Disease, Purpura,** and in some cases of **Hæmophilia.**

Differential Counts in Tropical Fevers.—White Robertson[8] points out the great value of differential blood-counts in India. **Malaria** is distinguished from kala-azar and seven-day fever by a very marked relative and actual increase of large mononuclear leucocytes; a feature which persists for months after parasites are no longer detected in the peripheral blood. In **Seven-day Fever,** lymphocytosis is a characteristic feature, but if a patient has malaria and has a high lymphocyte count, the case is a serious one. Not only has seven-day fever to be excluded, but it requires to be remembered that very young children with inflammatory diseases have lymphocytosis and not leucocytosis of polynuclear type. In the **Low Fever of Bengal,** the leucocytes are much diminished, the proportions being about normal. In **Amœbiasis,** the presence of fever with a maximum normal leucocyte count and a normal differential count should at once lead to a diagnosis of this condition. When the liver is suppurating, the total numbers increase, as well as the neutrophiles, and if this change takes place while a patient is under observation, it indicates that operative interference must not be delayed.

Enteric Group of Fevers.—Here the total leucocyte count is slightly diminished, but there is a high lymphocyte count. In those cases in which the organism found is *B. paratyphosus*, there is also an increase of the large mononuclears. In **Septicæmia,** the leucocytosis is extreme, with a very high percentage of neutrophiles, and myelocytes can be seen. *Eosinophilia* is described as frequent in non-suppurating **Tuberculous Glands,** in **Auto-intoxication Fevers** (1– or 2–day fevers with constipation), and in acute **Gonorrhœa.**

The Blood in Tuberculosis.—It is pointed out by Wright and King[9] who examined the cases in a sanatorium, that much useful information can be derived from the study of the blood in cases of **Tuberculosis.** They use the *Hæmolytic Index* as one of the factors in diagnosis and prognosis. To carry out the test, the blood is diluted in a red-cell pipette with a ·35 per cent NaCl solution. In ten minutes the cells are counted to see how many have not been hæmolyzed. One hundred and fifty thousand, divided by the number of cells found per cm. of undiluted blood, will give the hæmolytic index. The normal index is 1. Cases in which it does not fall below 0·5 are favourable, those not below 0·3 are doubtful, those below 0·3 are unfavourable and will die in from one to ten weeks. A fall in the hæmolytic index is a bad sign. The conclusions reached are that in uncomplicated cases the red cells are normal in number, and the hæmoglobin is about 85 per cent until a short time before death. The total white count steadily rises as the disease progresses, so that in uncomplicated cases the stage of the disease can be accurately determined by a total count. Increase in the polynuclears is a bad sign, but a decreasing white count, a falling polynuclear percentage, a rising hæmolytic index, and a rising lymphocyte percentage are all good signs.

Coagulation-time of the Blood.—Many methods have been suggested for performing an estimation of the coagulation-time, but apparently

none is really satisfactory. Wright's instrument is not very widely used, and though a result is very easily obtained by it, there are certain practical difficulties in its use, which, superadded to the costliness of the instrument, will render it obsolete as soon as a more convenient and acceptable method can be found.

Duke[10] describes a very simple method. A microscopic slide has mounted upon it two 5 mm. discs. One is covered with a drop of the patient's blood (*Fig.* 42), and the other with a drop of normal blood as nearly as possible of the same size as the first. The slide is now inverted over a dish containing water at 40° C., and the whole is covered with a warm damp cloth. At intervals the slide is picked up to see if the drop ceases to hang. As soon as this is the case (the drop remaining a perfect sphere), the time-interval is noted. This end-point is quite sharp and easy to determine. The apparatus can readily be made at home. By this method the normal time for coagulation is from five to seven minutes.

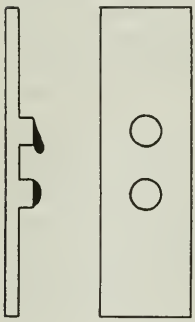


Fig. 42.—Duke's method of estimating the coagulation time.

Rudolf[11] uses the method devised by Sabrazés in 1904. This consists in filling glass tubes, one mm. in diameter, with blood, and breaking them across at half-minute intervals, slightly separating the broken ends. When a thread of fibrin appears, coagulation is said to have occurred. The tubes may be kept at any desired temperature in a Thermos flask at about 20° C. The author states that in his experience the coagulation-time varies considerably with the temperature, each degree centigrade between 15 and 20 making a difference of one minute in the coagulation-time. (It may, however, be pointed out that, after all, the question is one of whether the coagulation is delayed two, five, or ten minutes, and not whether the delay is one of less than two minutes. The use of a normal blood at the same time would also prevent any serious clinical error.) With this method Sabrazés gives eight minutes as the normal coagulation-time. The time does not vary with age or sex, or with meals. Rudolf does not find that citric acid or calcium salts have any effect on the coagulation-time.

The *Estimation of the Bleeding-time* is also of importance. Duke[10] describes a method for estimating this. A small cut is made in the lobe of the ear, enough to cause a drop of blood which will form a stain 1–2 cm. in diameter on blotting-paper during the first half minute. At half-minute intervals the blotting-paper is applied, and the time which elapses before the bleeding ceases gives the bleeding-time. This is normally from one to three minutes. It may be delayed five to ten minutes in severe anæmia. The bleeding-time is greatly delayed in cases (1) Where the platelet count is excessively reduced; (2) In which the fibrinogen content of the blood is excessively reduced; (3) In which both forms of reduction occur simultaneously. The

bleeding-time is independent of the coagulation-time, so that it may be normal in a case of jaundice in which the coagulation-time is very much delayed; or in a case of hæmophilia, or of purpura. If the platelet count is diminished, then a delayed bleeding-time indicates a **Hæmorrhagic Diathesis.**

Viscosity of the Blood.—The viscosity of the blood and plasma has been studied by many observers, in order to determine, if possible, whether any deductions could be made for diagnostic or prognostic purposes. The results have however not been satisfactory, the variations in the viscosity being indefinite. In normal man, the viscosity as compared with water is 4·55, and in women 4·51. It varies slightly with age. These values fail to be attained in cases of **Anæmia, Nephritis, Dropsy,** or of **Heart Disease.** On the other hand, the value is overstepped during the stage of recovery from **Anæmia, Diabetes,** and **Jaundice,** as well as in **Pneumonia.** So striking an increase occurs in **Polycythæmia,** that this factor is almost of essential importance for diagnosis. The difference between the viscosity of the plasma and that of the blood is brought out in cases of leukæmia, where the blood is less viscid than the plasma. The same holds true in cases of nephritis, where it is thought to be due to retained products of metabolism. There is no change in malaria.

A contribution by Austrian[12] gives a detailed study of a number of cases. He used Hess' viscosimeter, which may be thoroughly recommended as a useful instrument. It is advisable, according to Austrian, to retard coagulation by the use of hirudin, which does not interfere with the viscosity. The use of a fixed temperature does not appear to be important in bedside work. The results recorded in this paper give the normal value for plasma up to 2, the average being 1·86. A comparison of viscosity with hæmoglobin content was made, so as to have values for the coefficient, called the viscosity-quotient (introduced by Bachmann, 1908) $= \frac{Hb}{V}$. This is normally about 20. Austrian found the value diminished in **Typhoid Fever,** and also in **Pneumonia.** The same instrument was used by Vidoni and Gatti,[13] who point out the advantages obtained by its use. Their conclusions are similar to those of Austrian, although the number of cases reported is smaller.

Cheinisse[14] discusses the relations of viscosity variations to the work of the heart, pointing out that increase in the viscosity is likely to cause hypertrophy, and lead to the production of atheroma. He thinks that a finding of an increase of viscosity would render unnecessary an enumeration of the red cells, and would also serve as a valuable prognostic agent. (On the other hand, these sanguine opinions are not shared by other observers.) His quotations of the effect of iodide of potassium on viscosity in cases of arteriosclerosis are, however, of interest, and might justify further observations on the same lines. He states that in **Arteriosclerosis** the use of moderate doses of this drug reduces the coefficient of viscosity 5 to 10 per cent within a fortnight, coincidently with an improvement in the general condition of the patient.

Meiostagmin Reaction.—This method of clinical diagnosis, introduced by the Turin school, has been studied more fully during the past year. Micheli and Cattoretti[15] have modified Ascoli's technique slightly. The first requisite is the antigen, which is a concentrated ethereal solution of an alcohol-ethereal extract of human carcinoma. The more specimens of antigen that are employed, the more certain the results. The optimum dilution is 1–500 to 1–1250. The serum of the patient is diluted 20 times with normal salt solution. To 9 c.c. of dilution is added 1 c.c. of the diluted antigen, and, as a control, to 9 c.c. of diluted serum is added 1 c.c. normal saline in place of the antigen. After shaking, the tubes are placed in the incubator for two hours, and the number of drops passing through marked places on the Traube stalagmometer measured. The difference between the two tubes shows the presence or absence of a reaction. The passage of a larger number of drops through the measured distance after treatment with cancer antigen, indicates the existence of **Cancer** in the patient. The antigen requires to be tested against (*a*) the patient's serum, (*b*) a definitely active neoplastic serum, (*c*) a definitely non-neoplastic serum, (*d*) the normal saline. That is to say, it would be better to put up the 1–20 dilution into four different tubes than to be merely satisfied with control (*d*). Micheli and Cattoretti obtained positive results in 90 per cent of cases of cancer, so that the value of the reaction may be regarded as assured.

The same reaction can be employed for other purposes, such as the testing of serum in cases of **Typhoid Fever** in place of the Widal reaction; in identifying **Paratyphoid, Tuberculosis,** and **Syphilis** (in which it is more specific than the Wassermann reaction, according to Ascoli,[16] since it is not given by leprous patients). The explanation of the reaction is that the antigens are of lipoid nature, and react with the meiostagmins of the serum so as to cause a depression of the surface tension.

Stammler[17] discusses the technical difficulties of the reaction, and especially points out the instability of the cancer antigen in the presence of light, moisture, or agitation. He obtained positive results in 73 per cent of cancer cases, and a number of ill-marked results in other cancer cases, but no positive results in other diseases. In connection with this subject a reference may be made to a publication by Foerster,[18] where an extract from cancer was used as antigen in the Wassermann test. An aqueous extract was made, as one made with alcohol was found useless. In a number of cases where there had been syphilis, a positive Wassermann reaction was obtained just as well as with a proper syphilitic extract, whereas cases of pure cancer gave no reaction at all.

The Freund-Kaminer Cell Reaction.—Freund and Kaminer noticed that the normal serum is able to dissolve cancer cells, whereas the serum of a patient suffering from cancer is powerless to do so. From this it is concluded that normal serum contains an active substance which is absent in a patient suffering from cancer. On the other hand,

they found that a cancer patient contains a second substance which is able to protect cells, but other observers have not found the same constancy of results that are described by these authors, and certain difficulties are pointed out which interfere with the value of the reaction. For instance, the preparation of suitable emulsions of cancer cells is very difficult, and Kraus, v. Graff, and Ranzi[19] describe their failure to obtain more than four suitable emulsions from all the tumours which they obtained either from operations or at autopsy over a period of nine months.

The *results* of this test, as given by the authors named, are that (1) 71·4 per cent cancer cases gave a positive result, 15·3 per cent other cases gave a positive result; (2) 25 per cent of cancer cases gave a negative result, 61·2 per cent non-cancer cases gave a negative result; (3) 3·5 per cent cancer cases gave a doubtful result, 23 per cent other cases gave a doubtful result.

Activation of Cobra Poison.—This has been tested in order to compare the results with those obtained by the preceding method. The results of the experiments showed that positive results were obtained more frequently with the cobra reaction (81·2 per cent), but that a larger percentage of non-cancer cases gave a positive result. The point that is of chief interest to the clinician is that after an operation the blood serum will give a positive result in the cobra reaction, even though there be no relapse, whereas the cell reaction (Freund) is quite negative after operation, and remains so until a secondary appears. Neither reaction is sufficiently definite to allow the clinician to say an operation is necessary or that it is contra-indicated, but the presence of the positive cell reaction may be taken in conjunction with the other clinical symptoms. It is pointed out that the serum from pregnant women also gives a positive cobra reaction, and sometimes gives a positive cell reaction.

Cancer Reactions.—Molakow[20] gives a summary of the work done on these subjects with a few additional facts, but decides that there are no specific precipitins in cancer serum, and that iso- and hetero-hæmolysins are not specific either. The increased antitryptic power of serum is due to the cachexia. Further, the change in resistance of red cells to cobra-hæmolysis occurs in other conditions as well, complement binding will take place just as well in syphilis, the anaphylaxy reaction is also uncertain, so that there remain only the Meiostagmin reaction and the Freund-Kaminer reaction. It is the second one to which the writer refers, and he finds that only two-thirds of normal sera gave a correct reaction, while a quarter of *normal* cases behaved like *cancer* patients.

Much-Holzmann Reaction for Insanity.—This reaction depends on the ability of serum of patients suffering from **Dementia Præcox** or **Maniacal-depressive Insanity** to prevent cobra venom hæmolysing normal red cells. An extensive research by Moss and Barnes[21] led these authors to believe that the test was of no clinical value.

Catalytic Activity of Blood. — This has been investigated by

Winternitz.[22] The *technique* is as follows: ·025 c.c. of blood is drawn from the ear lobe and diluted with 10 c.c. water; ·5 c.c. is placed in a 100 c.c. Erlenmeyer flask containing a vial with 5 c.c. neutral hydrogen peroxide, and connected to a gas burette. The two fluids are brought into contact, shaken, and the amount of oxygen given off is measured. The procedure requires only a short time. Normally 13 to 17 c.c. gas will be evolved within 15 seconds. Occasionally normal blood will give varying amounts from 12 to 22 c.c. The catalytic activity of the blood is constant from day to day over long periods of time. The *results* obtained were as follows: There is a characteristic rise of catalytic activity in **Acute Peritonitis.** It is raised in hyperthyreosis. It was also found raised in two cases of cerebral hæmorrhage. It is diminished in hypothyreosis, markedly so in **Uræmic Coma,** and in obstructive suppression of urine, as well as in the toxæmia of pregnancy. It is unchanged in typhoid fever, diabetes, catarrhal jaundice, as well as in nephritis without renal insufficiency.

Detection of Bacteria in Blood.—Fried and Sophian[23] studied 250 cases in order to ascertain whether bacteria could be found by direct examination of the blood without making cultures. The method consisted in pouring 1 c.c. of blood into 20 c.c. of sterile 1 per cent aqueous solution of sodium citrate. The mixture was then centrifuged for half an hour, and a few drops of deposit were used to make smears. The latter were fixed by heat, treated with 1 per cent acetic acid, and then stained by Gram's method. Organisms were discovered in 97 per cent of cases where the blood culture was positive, and in 9 per cent of cases in which the blood culture was sterile. They point out that absolute asepsis is essential, and that Gram-negative organisms cannot be detected with certainty.

Serum Test for Typhoid.—A simple method of carrying out this reaction by the bed-side is given by Gillman.[24] The reagent is prepared by inoculating an Erlenmeyer flask containing 100 c.c. of broth with one loop of an 18 hours' agar culture of *B. typhosus.* After 24 hours' incubation, 1 c.c. formalin is added, and the flask kept at room temperature overnight. The mixture is tested for sterility, then filtered, and kept in suitable vessels in a cool dark place. Into a piece of glass tubing sealed at one end are placed 48 drops of culture and two drops of patient's blood; this mixture is shaken and left for five hours. If at the end of that time the supernatant fluid is clear, the reaction is positive. It is advisable to use a control tube. Another modification is described by Bass and Watkins,[25] who dilute one drop of patient's blood with four drops of water. One or two drops of the mixture are put upon a microscopic slide, and to that is added a suspension of 10,000 million typhoid bacilli per c.c. of a solution containing 1·7 per cent sodium chloride and 1 per cent formaldehyde. The slide is tilted to and fro, and in less than a minute a mealy deposit will appear at the edges. If there is no reaction in two minutes, it is regarded as a negative case.

REFERENCES.—[1]*Deut. Med. Woch.* 1911, 673; [2]*Deut. Med. Woch.* 1911, 676;

[3]*Fol. Hæmatol.* 1911, 130; [4]*Amer. Jour. Med. Sci.* 1911, i. 638; [5]*Med. Ann.* 1911, 347; [6]*Wien. klin. Woch.* 1910, Dec.; [7]*Jour. Amer. Med. Assoc.* 1911, i, 1457; [8]*Ind. Med. Gaz.* 1911, 161; [9]*Amer. Jour. Med. Sci.* 1911, i, 852; [10]*Jour. Amer. Med. Assoc.* 1910, 1185; [11]*Amer. Jour. Med. Sci.* 1910, 807; [12]*Johns Hopkins Hosp. Bull.* 1911, 9; [13]*Gaz. deg. Osped.* 1909, 1265; [14]*Sem. Méd.* 1910, 597; [15]*Wien. klin. Woch.* 1910, 1555; [16]*Deut. Med. Woch.* 1910, 1997; [17]*Münch. Med. Woch.* 1911, 1957; [18]*Lancet* 1911, ii, 1695; [19]*Wien. klin. Woch.* 1911, 1003; [20]*Münch. Med. Woch.*, 1911, 2207; [21]*Johns Hopkins Hosp. Bull.* 1911, 278; [22]*Ibid.* 1911, 109; [23]*Amer. Jour. Med. Sci.* 1911, ii, 88; [24]*Med. Rec.* 1910, Oct. 29; [25]*Arch. Int. Med.* 1910.

BLOOD-PRESSURE. *Carey Coombs, M.D., M.R.C.P.*

The term "blood-pressure" is usually employed as being synonymous with arterial tension; mainly because we know almost nothing of capillary and venous tension. Our knowledge of arterial tension itself is far from complete, as this year's papers show.

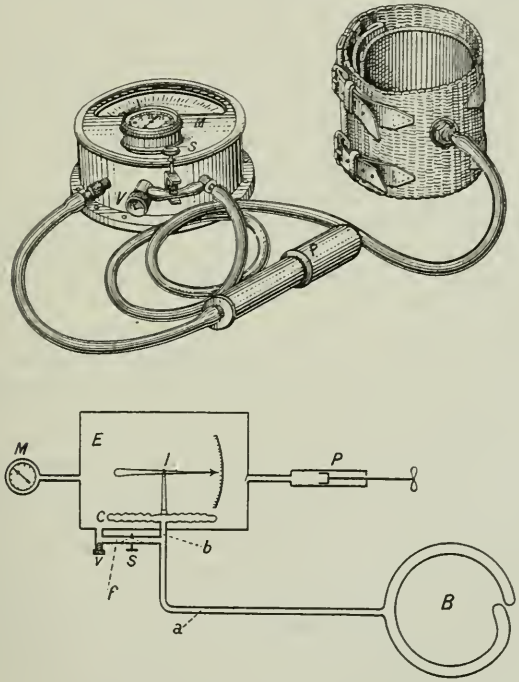


Fig. 43.—Pachon's Sphygmo-oscillometer.

Measurement of Arterial Tension.—The *sphygmo-oscillometer* devised by V. Pachon, of Paris, is recommended for accuracy in descriptive articles by Eckenstein[1] and Bachmann.[2] It consists of a rigid and air-tight metallic box *E*, which contains an aneroid chamber *C* (see *Fig.* 43). At the beginning of a record the box *E*, the aneroid chamber *C*, and the armlet *B*, are in direct communication with each

other by means of the three-way passage *f*, *b*, *a*. The pump *P* is used to establish a given pressure throughout the combined system; the pressure is read from the manometer *M*, whose graduations correspond to centimetres of Hg; by the escape valve *V* the pressure can be reduced at will; and by depressing *S*, a separating key, the interior of *E* can be cut off from that of the armlet *B*, tube *a*, and aneroid apparatus *C*, thus allowing the arterial pulsations to be transmitted direct from the armlet *B* to the registering needle *l*. To measure a patient's blood-pressure the armlet is applied to the forearm just above the wrist, and the atmospheric pressure in the whole system pumped up to a point likely to be above that of the maximal systolic pressure. The separator is then pressed down and the needle *l* watched. If no deflection occurs, it means that the atmospheric pressure is too high, and must be lowered, about 1 cm. at a time, by opening the screw-valve *V*. The maximal or systolic pressure is that at which the needle first shows definitely increasing oscillations. To find the diastolic tension, the atmospheric pressure must be lowered gradually by opening the valve *V* until the point of maximum oscillation is reached; this marks the diastolic pressure. The advantages claimed for this method are elimination of the personal equation and clearer definition of the diastolic pressure. It is to be noted that the readings are higher by about 20 cm. than with the Riva-Rocci type of instrument.

Other investigators, to wit Goodman and Howell[3] and G. Oliver,[4] have been at work trying to devise an *auscultatory* method of determining arterial tension. Their work, though interesting, has not yet given an accurate means of measuring diastolic pressure, which is the chief end as yet unachieved.

High Arterial Tension. CAUSATION.—Gibson's address[5] is an excellent account of the various factors influencing blood-pressure; though unsuitable for abstract, it will be found admirable for reference.

Bain[6] continues his work on pressor bases in the urine. These substances are apparently derivatives of leucin and tyrosin, and originate from protein in the alimentary canal by putrefactive processes, and their physiological action is that of raising the blood-pressure. He finds that they are absent from the urine until the age of about fourteen. The amount is reduced by a vegetable diet, also to a less extent by the substitution of eggs and fish for butcher's meat. In cases of high arterial pressure the excretion of these substances is greatly diminished, while in gouty patients the output is normal. The inference which he draws is that high arterial tension in his cases was due to a failure in the excretion of these bodies. French[7] does not think the toxin theory of high tension sufficient of itself, and advances a very ingenious explanation. Arteriosclerosis of the visceral arteries is, he says, a constant accompaniment of high tension. It is found in sedentary town dwellers who over-work the arteries of their digestive organs while giving the vessels of their limbs as little to do as possible. This leads to sclerosis of the visceral arteries, and thereby to interference with the blood-supply of organs whose healthy functioning is necessary

to life. To ensure for these organs the supply of blood which they need, the heart's work is increased, and the other arteries of the body are tightened. This leads to hypertension, and to hypermyotrophy of the heart and arteries.

TREATMENT. — Hudson[8] recommends a **Wet Pack** for crises of hypertension and for combined high pressure in the sleeplessness of neurasthenia. In the latter state an abdominal compress at 70° F. is also recommended. For persistent high tension several hours' **Rest** daily must be insisted on, often in bed; during this rest, gentle massage and passive exercises should be practised. Worry is best avoided by sending the patient away from home for treatment. **Massage** is often of use apart from the rest; the Swedish and vibrating types are of special value. Hudson also recommends various **Baths** —the carbon-dioxide bath, the oxygen bath at 97° F. or lower, auto-condensation, and the electric-light bath. Thorne[9] speaks highly of the carbon-dioxide bath, in association with systematic exercise. Sayer[10] claims that arterial tension can be remarkably and permanently reduced by **High-frequency** applications. The permanence, however, depends on its association with suitable diet, exercise, etc. Bach[11] has found it possible to reduce blood-pressure by applications of the **Ultra-violet Rays.** French[7] makes a point of the need for "arterial gymnastics." The various arteries, ought, he says, to divide the work of the circulation between them, those of each part having their regular periods of work and rest. This explains the beneficial effect of golf and of Nauheim exercises in cases of moderate hypertension. He recommends a simple daily **Exercise** after the morning bath, such as stooping a dozen times with the hands above the head and the knees straight.

Diet.—Elsner[12] allows meat once daily; eggs, fresh fish, easily digestible vegetables, and a limited supply of fluids. Alcohol is forbidden, also coffee and tobacco.

Drugs.—Matthew[13] has been continuing his research into the action of drugs on high arterial tension. He did not find any lowering of pressure following the administration of benzoates, hippurates, diuretin, or thyroid extract. The effect of calomel, if any, is indirect. **Iodides** on the other hand, lower the tension except in the presence of arteriosclerosis, by a vasodilator action. The initial dose should be 10 gr. of potassium iodide, to be increased rapidly if needful. Organic iodides contain too little iodine to be effective; only in cases where iodides are contraindicated by alimentary disorders should **Sajodin** be substituted. Elsner[12] finds that some people tolerate the **Iodide of Strontium** or **Rubidium** better than that of potassium. He uses **Nitrites** especially as emergency drugs for angina and other forms of painful vascular spasm, though sodium nitrite may be given continuously, with or without **Theobromine.** For occasional use large doses of the nitrites may be needful, such as liq. trinitrini 15 min. For patients with "pounding, irritable hearts," he advises **Strontium Bromide,** 15 to 20 gr. thrice daily; to this may be added 2 to 4 min. of

Tinct. Aconiti or **Tinct. Veratri Viridis.** Williamson's experience[14] leads him to consider **Guipsin** an effective hypotensor. It is an extract of mistletoe, the active principles of which are two glucosides, saponins. It is given in pills, each of which contains ·05 gram of the active principles; six to twenty-five of these may be given daily, without ill-effect. It does not, however, reduce blood-pressure in every case.

When high pressure is confirmed it is useless and even harmful to try hypotensive measures. The high tension has become necessary for the maintenance of an adequate supply of blood to vital organs. Under these circumstances, and especially if the patient has to keep at work with evidences of failure of the cardiac contractility, French[7] recommends the use of **Tinct. Digitalis** 15 min. three or four times daily. This may be combined, says Elsner,[12] with **Theobromine Salicylate** ·6 gram., or **Caffeine-Sodium Salicylate** ·24 gram. For the employment of **Vasotonin,** *see page* 64.

Low Arterial Tension is associated, according to Edgecombe,[15] with the following conditions: chilblain circulation, neurasthenia, great excess in tobacco, cardiac dilatation, fibrositis, phosphaturia, and arthritis deformans. It is also frequently noted in slack, depressed persons apart from any disease. In such persons treatment which produces a rise of pressure is beneficial. Of the drugs which he has used for this purpose, **Pituitary Extract** seems to be the most effective. He also recommends various baths, particularly a course of the **Vichy Douche.**

REFERENCES.—[1]*Brit. Med. Jour.* 1910, ii, 1765; [2]*N.Y. Med. Jour.* 1911, i, 214; [3]*Univ. Penn. Med. Bull.* 1910, Nov.; [4]*Proc. Roy. Soc. Med.* (*Clin. Sect.*) 1910, Nov.; [5]*Edin. Med. Jour.* 1911, Mar.; [6]*Lancet*, 1911, i, 1409; [7]*Clin. Jour.* 1911, 199; [8]*Pract.* 1911, ii, 373; [9]*Ibid.* 96; [10]*Brit. Med. Jour.* 1910, ii, 1052; [11]*Deut. med. Woch.* 1911, Mar. 2; [12]*Amer. Jour. Med. Sci.* 1911 i, 22; [13]*Edin. Med. Jour.* 1911, 228; [14]*Pract.* 1911, 690; [15]*Ibid.* 515.

BONE, DISEASES OF. *Priestley Leech, M.D., F.R.C.S.*

Moorhof Bone Plug.—This method as used by Clark Stewart[1] is as follows: it is employed to fill any bone defect; in cavities made in healthy bone; in defects left after some compound fractures; in acute osteomyelitis, both as a temporary filling to avoid gauze packing, and as a permanent stopper of the evacuated cavity; in all forms of subacute and chronic osteomyelitis, including bone abscess; in tuberculosis of bones and joints. Union by first intention is obtained in most cases of chronic and subacute osteomyelitis, and in tuberculous cases. There have been no cases of extrusion of the wax or reopening of the wound and escape of serum and wax. On the contrary, wounds which have opened early from cutting out of stitches or tension, exposing the wax, have regularly granulated over the wax, leaving it *in situ*, as shown by later skiagraphs. In a few acute cases with infection of the soft parts, the wax has been used as a temporary dressing, replaced once or twice before the wound is closed over it.

In acute cases operated upon under Esmarch's ischæmia, the cavity

resulting from the operation on the bone is merely mopped out with carbolic acid, followed after one minute by alcohol, then dried and filled with the Moorhof wax, and the soft parts are sutured and drained before removing the Esmarch.

In less acute cases the same technique is used, except that the Esmarch bandage is removed and all bleeding checked before drying and filling the bone cavity. This is done by alcohol, pressure, and hot air. The periosteum and soft parts are then closed without drainage.

Inflammations of Bone.—Le Conte,[2] of Philadelphia, analyses 60 cases of acute inflammation of bone. As regards the etiology, it is important to note that 90 per cent of the cases were in males, that in 73·5 per cent, the tibia was the bone involved, and that in 63 per cent a history of contusions, wounds, and foreign bodies was given ; 83 per cent of the cases occurred between the fifth and thirtieth years. The conclusions he reaches are : (*a*) Prompt and thorough surgery saves life and limits necrosis ; (*b*) Suppuration beneath the periosteum does not exclude an infection of the medulla ; (*c*) Within seventy-two hours of the onset of the disease osteoperiostitis is localized, usually in the cortex of the bone, and incision, disinfection, and drainage are sufficient to bring about a cure. If the symptoms are not abated twenty-four hours later, the medullary cavity should be opened ; (*d*) In operations after the third day where systemic symptoms are pronounced, the medullary cavity should always be opened sufficiently to expose healthy marrow and healthy bone. His mortality of 10 per cent was directly due to delay in operation and to inefficient surgery at the primary operation. He firmly believes that an attempt should be made in the acute stage to remove at the primary operation all bone that is diseased. If operation is delayed or imperfectly done, the whole shaft may have to be resected.

Central Osteitis.—Charters Symonds[3] quotes cases showing that a septic focus in the bone can lie dormant for over thirty years. In cases where the focus cannot be removed, and the cavity made shallow so that it can be filled with the soft parts, he has used metal drains with great success. These metal tubes are best made of silver, but German silver and aluminium will do. In large cavities a diameter of half an inch is sufficient. These tubes should be gradually reduced in size, and should be worn for six months or a year, when they can be replaced by a metal rod with a nail head, or a piece of silver wire (such as is used for suturing the patella) with the end doubled over.

References.—[1]*Ann. Surg.* 1911, May ; [2]*Boston Med. and Surg. Jour.* 1911, June 1 ; [3]*Clin. Jour.* 1910, Nov. 16.

BONE-MARROW, CLINICAL EXAMINATION OF. *O. C. Gruner, M.D.*

Ghedini,[1] in advocating puncture of the bone-marrow during life, suggests that a case which shows nothing specific in the blood might yet show sufficient changes in the bone-marrow to enable a correct diagnosis to be made. He describes several cases in which the clinician was at a loss to understand the case, where the marrow showed

characteristic changes post mortem such as were exactly in accordance with the lesions discovered. Similarly, cases are described in which this method of diagnosis would have proved to the surgeon that a given operation was without any prospect of curing the disease found at operation.

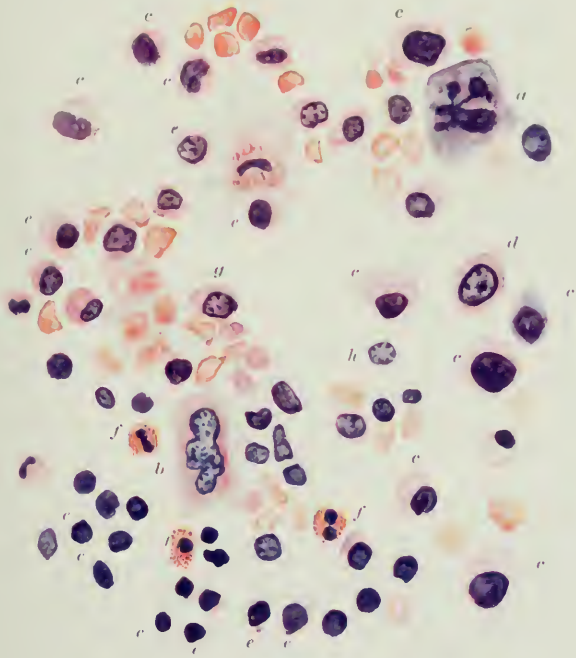
The *technique* of puncture is simple, and though it is not described in the contribution under review, it is sufficient to say that the reviewer's experiments show that a strong but fine trocar (with cannula) can be inserted into the tibia just to the inner side of the tuberosity, using a strong solution of *iodine* as an efficient cutaneous disinfectant. The operation will be found to involve less than a minute's time, and to be no more serious than a thoracocentesis. Having procured the material, it is immediately spread on slides as in preparing blood films, and may be stained with Giemsa (*see under* LEUCOCYTES, *p.* 161) or Ehrlich triacid. The proportions of lymphocytes and myeloid cells to other cells are counted as in an ordinary differential count and diagnosis is made therefrom in accordance with other clinical findings. (*Plates VI, VII, VIII, IX.*)

In interpreting these results, we have to consider several factors. Firstly, there is the age of the patient. The older the marrow the more fat it contains and the less red it is, and the older the person the more localized is the area in which red marrow can be found. Secondly, the amount of red marrow varies in different parts of the body and even within different parts of the same bone. The third factor, that of disease, is the one which is of chief importance, for when there is destruction of red cells, the erythroblastic parts hypertrophy, and when there is over-use of white cells, the leucoblastic parts become hypertrophied. The pale marrow then becomes red, and the red marrow shows evidences of great activity. Continued over-activity leads to the erosion of the adjoining bone trabeculæ and replacement of that tissue by new marrow cells (Hunter[2]). Ordinary bone-marrow consists of groups of fat spaces between which is a scanty amount of connective tissue and a variable number of capillaries. It is in this connective tissue that the blood-forming cells are situate, and the more active the cells the less conspicuous the spaces. When seen in the most favourable circumstances, it is easy to see areas marked off more or less clearly in which the preponderant cells are nucleated red cells lining the interior of angiectatic capillaries, while the lumina contain clusters of adult red cells. Just as in pathological blood we have normoblasts, megaloblasts and intermediate forms, so in the marrow we find these nucleated red cells are either normoblastic or megaloblastic. Besides the red cell, or erythroblastic, areas, there are others representing the foci of development of the white corpuscles. These foci contain myelocytes which are in a state of active division, and include polynuclear leucocytes as well as smaller numbers of the other varieties of white cells found in the blood stream. Occasionally areas may be found in which a definite resemblance to the lymphoid follicle of other parts of the body can

PLATE VI.

MICROSCOPICAL APPEARANCES OF BONE-MARROW TAKEN FROM THE LIVING SUBJECT

Fig. A.—This specimen shows the cells in healthy bone-marrow as seen in an ordinary paraffin section stained with hæmatoxylin and erythrosin. The preponderance of small mononuclear elements is noticeable, as well as the presence of a few larger cells, which are probably myelocytes, and two very large cells, one of which is in a state of mitosis. A small number of eosinophile cells forms a common feature in the bone-marrow, and their absence as represented in *Plate VII* is pathological. The drawing represents an actual field seen with the ordinary high-power lens.



(*a*), gigantoblast; (*b*), megakaryocyte; (*c*), myelocyte; (*d*), endothelial cell; (*e*), myeloic lymphoid cells; (*f*), eosinophile cells; (*g*), plasma cell; (*h*), normoblast. The red cells are not lettered.

PLATE VII.

MICROSCOPICAL APPEARANCES OF BONE-MARROW—*continued*

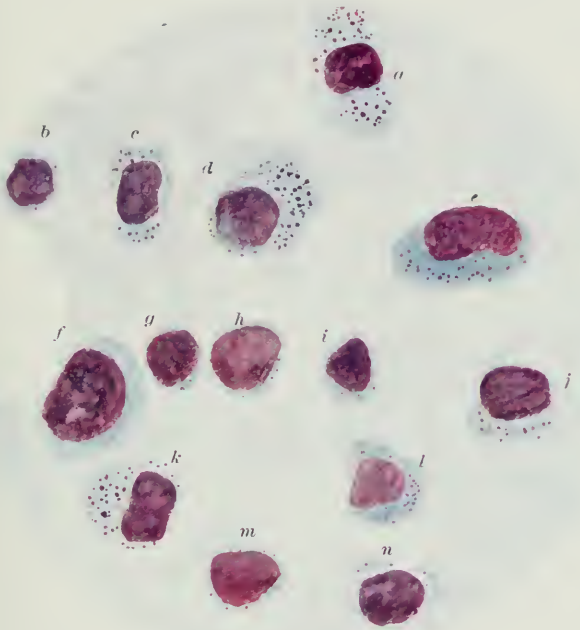


Fig. B.—This introduces the appearance as seen by the Giemsa stain, as well as showing a characteristic preponderance of white-cell forming cells. The background is faintly tinted, as is apt to occur in smears made from the bone-marrow; the clear spaces represent fat. It will be seen that there are azure granules in the cell body of the large cells, these granules being both fine and coarse. In the smaller cells the granules are all fine.

(*a*, *d*, *k*), leucoblasts; (*b*, *g*, *h*, *i*, *m*), myeloic small lymphoid cells; (*c*, *e*), myelocytes (azure granules, no nucleolus, neutrophile granules); (*f*), lymphoidocyte (nucleolus, no granules); (*j*), promyelocyte (myelocyte form of nucleus, a few non-azure granules); (*l*), mesolymphocyte (abundant cytoplasm, a few azure granules); (*n*), large mononuclear leucocyte.

PLATE VIII.

MICROSCOPICAL APPEARANCES OF BONE-MARROW—[illegible]

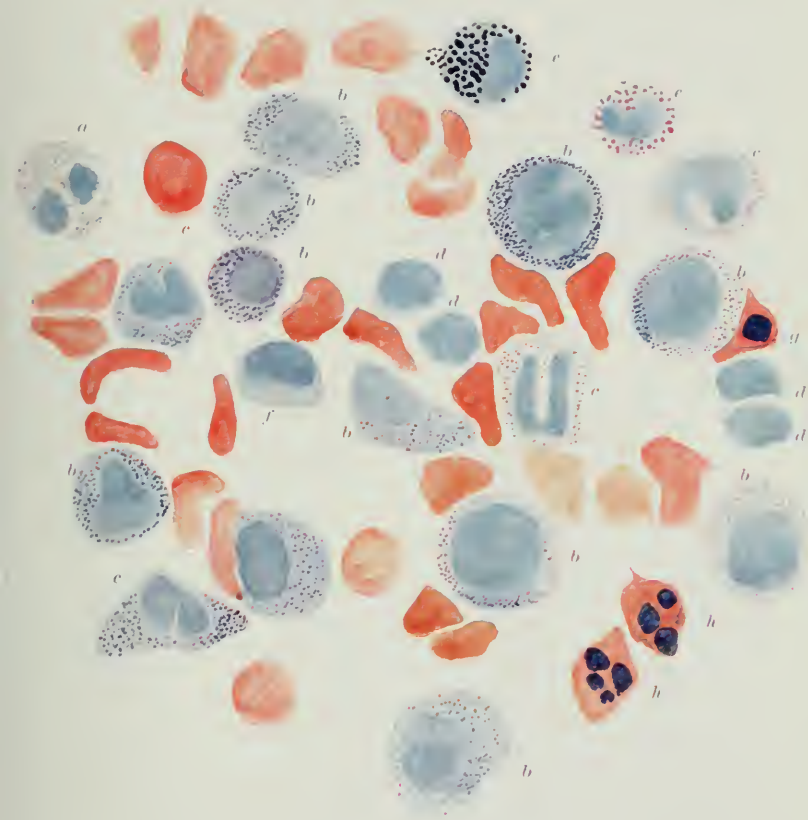


Fig. C.—This represents a film preparation from the bone-marrow stained by Ehrlich's triacid stain, and gives the cells present in a marrow which is actively forming both red and white cells. The poorness of staining of the nucleus is well shown, and the conspicuousness of the granules (rendering the diagnosis of myelocytes very easy) explains why this stain has been so much favoured. The nucleated red cells are conspicuous, and if very abundant would render the specimen one of erythroblastic reaction. The red cells are distorted. In this case, as in *Plate IV*, the marrow cells are intermingled with blood from the blood-vessels, a source of error which has no practical importance except that it renders a very careful cell-count superfluous.

(*a*), polynuclear leucocyte; (*b*), myelocyte; (*c*), metamyelocyte; (*d*), lymphocyte; (*e*), eosinophile myelocyte; (*f*), large mononuclear leucocyte; (*g*), normoblast; (*h*), pycnotic normoblast (or small megaloblast).

be made out. To this list must be added the large giant cells with polynuclear nucleus (sometimes basket-shaped), which come to be specially numerous in febrile diseases associated with extreme leucocytosis. A few pigment cells may also be seen, which are of similar nature to those frequently met with in the splenic reticulum.

The changes that may be observed consist in a hypertrophy of one or other of the germ centres referred to. If the leucoblastic areas be involved, it is frequently found that the neutrophile myelocytes are specially conspicuous. Here the associated blood change is a neutrophile leucocytosis. On the other hand, an increase of eosinophile myelocytes does not necessarily accompany eosinophilia of the blood. Among the degenerative changes met with in the bone-marrow, we have the cases in which the fat is increased owing to atrophy of the erythroblastic or leucoblastic foci, and the rarer cases in which there is a gelatinous degeneration (prolonged suppuration, starvation), or cases of cirrhosis of the marrow, which occur in old age, syphilis, and in Paget's disease. Tumour formations may also arise, in which case the cells present will be totally abnormal, or may all resemble myelocytes, as in the myelomas.

To demonstrate the justice of Ghedini's contention, we may quote the following figures. A case showed the following cells in the marrow: numerous erythrocytes, 12 per cent polynuclears, 6 per cent transitional forms, 5 per cent myelocytes, 77 per cent of lymphoid elements. The white cell blood count showed 42,000 per c.mm., and the lymphocytes preponderated. In spite of a moderate grade of leucocytosis, a diagnosis of lymphatic leukæmia could be made. A second case showed slight leucocytosis in the circulating blood, and the question was whether the patient had pernicious anæmia, cancer of the stomach, or pseudoleukæmia. The bone-marrow was yellow, fatty, and showed no characteristic change. The first and last suggestions could therefore be excluded, and a diagnosis of cancer of the stomach established. This proved correct. In a third case, the finding of normal red cells in normal-coloured marrow with normoblasts, megacaryocytes, and a preponderance of myelocytes of normal type showed the marrow to be healthy and excluded Hodgkin's disease. The diagnosis lay between Hodgkin's disease and tuberculosis.

While the clinician should be on his guard against optimism in the diagnosis of disease by this method, it is evident that a valuable adjunct to diagnosis may be expected from it.

REFERENCES.—[1]*Wien. klin. Woch.* 1910, 1840; [2]*Glasg. Med. Jour.* 1911, 23.

BRAIN, SURGERY OF. *Keith W. Monsarrat, F.R.C.S.*

Hæmostasis in Cerebral Operations.—Attention has been drawn to this most important and difficult subject. With regard to the vessels of the scalp, Makkas[1] has proposed to circumscribe the field of operation with a number of **Spring Clips** to check hæmorrhage from the flap. These clips consist of two jaws kept in contact by a spring. The lower jaw is passed between the bone and the coverings; the

upper jaw, which lies externally when the clip is in place, presents a groove into which the lower jaw fits. The clips require a special forceps for their application ; they appear to be a useful small addition to technique (*Fig.* 44).

Cushing[2] has also written on the subject of hæmostasis, and he summarizes his paper as follows : One of the chief objects of concern in intracranial surgery should be the avoidance of any unnecessary loss of blood, for at best, in many cases of brain tumour associated with venous stasis, bleeding is likely to be so excessive as to necessitate postponement of the final steps of the procedure until a second or even third session. The common methods of blood-stilling by sponge, clamp, and ligature are largely inapplicable to intracranial surgery, particularly in the presence of bleeding from the nervous tissues themselves, and any device which serves as an aid to hæmostasis in these difficult operations will bring a larger number of them to a safe termination at a single sitting, with less loss of blood and less damage to the brain itself. In addition to the more familiar tourniquet for the scalp,

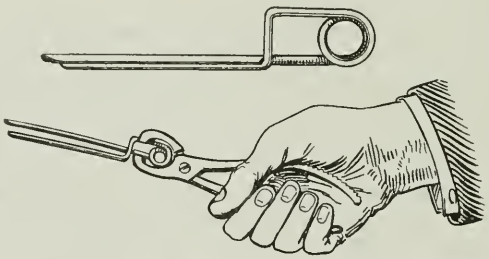


Fig. 44.—Makkas' spring clips for hæmostasis in cerebral operations.

and wax for diploic and emissary bleeding, suggestions are offered as to the use of **Gauze Pledgets, Dry Sterile Cotton,** fragments of **Raw Muscle** and other tissues, as well as sections of **Organizing Blood Clots** for superficial meningeal bleeding and **Silver " Clips "** for inaccessible individual points either in dura or brain.

The clips to which he makes reference are shown in the accompanying illustrations (*Figs.* 45–48). They are particularly of use in the course of enucleation of a tumour. Despite the tendency of the brain to fill up when thus relieved, the cavity remaining after the ablation of the tumour may persist and exude ; a good plan then is to fill the cavity with dry absorbent wool, to be replaced when it has been saturated. If the cavity is large, it may be filled with serum at the end of the operation, and the dura mater brought together as exactly as possible over it. More and more frequently Cushing discards drainage tubes to remove to the exterior the excess of exudation following an operation, particularly in those done in two stages.

Apoplexy.—Cushing[3] says on this subject, " I feel that much of the danger which occurs in these conditions is due to compression from

the extravasation and to secondary œdema rather than to actual destruction of important nerve paths, and it would seem rational, if we are to regard patients with cerebral vascular disease as deserving of radical measures for their relief, to attempt the removal of the clot, even though it be intracerebral, just as we would if we were dealing with an extracerebral extravasation." He further says, "There have been one or two excellent recoveries among one dozen cases operated

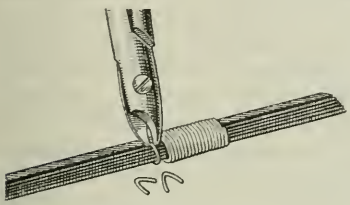


Fig. 45.—Silver wire loops being cut after wrapping on grooved steel pencil.

Fig. 46.—Clip in position in jaws of holder.

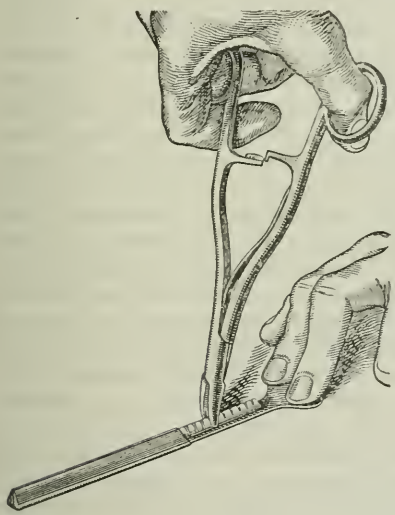


Fig. 47.—Clips being picked up from the loaded magazine.

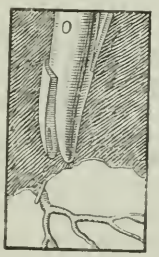


Fig. 48.—Clip placed on meningeal vessel, the instrument showing the mould for the clip.

on, most of them in the terminal stages of compression, but whether they would have been equally satisfactory without the operation must remain a matter of some uncertainty until a much larger group of cases have been studied and a much longer interval elapsed."

Iselin[4] reports a case which has some points of interest: A man aged 62 was brought into the hospital after a fall, but it was doubtful whether the cerebral compression from which he was suffering led to the fall or was caused by it. The diagnosis lay between subdural

hæmatoma, cerebral contusion, and apoplexy. Under the circumstances the skull was opened. Beneath the dura mater there was a considerable quantity of blood-stained fluid. The convolutions were flattened and did not pulsate. Ventricular puncture gave exit to fluid blood ; after this puncture the brain began to pulsate, and then suddenly it commenced to herniate through the wound and the dura. To diminish the internal pressure causing this hernia, a pair of forceps were passed into the ventricle, and a large amount of blood came away. The forceps were replaced by a drain. The patient died at the end of twenty-four hours. The autopsy showed that there was no fracture of the head, but a cerebral hæmorrhage originating in the posterior segment of the internal capsule. The hæmorrhagic focus communicated with the fissure of Sylvius, and internally with the lateral ventricle. The case illustrates one of the difficulties that may be met with in operating for apoplexy. In apoplexy of the common type it appears quite certain that puncture of the lateral ventricle is inadvisable, as likely to lead up to recurrence of the hæmorrhage.

Milligan[5] relates a case, and uses it as an argument in favour of operation for the purpose of removing clots the result of apoplexy. The patient was aged 42. After opening the dura the wound was enlarged, and the fissure of Rolando was found to present beneath the membranes a slight bulging, which on opening gave exit to about half an ounce of clear serous fluid ; further investigation disclosed a small thread clot. The surrounding portion of the brain was pushed aside, a pear-shaped clot was removed, and the cavity wiped out carefully. At about the location of the artery of cerebral hæmorrhage, a small firm clot was found adherent to the side of the cavity ; this was left. A wick of gauze was placed as a drain, and the wound healed without symptoms. The patient regained consciousness on the fourteenth day after trephining. Paralysis first disappeared in the left leg, then in the arm. He went back to work six months after the operation. This operation was undertaken with the idea that if the clot is left *in situ* a scar results (or possibly a hæmorrhagic cyst) which renders the patient permanently hemiplegic and aphasic. The case is interesting, but of course no deductions can be drawn from a single example. Whether removal of the clot can be relied upon to assist a return to the normal with sufficient certainty to justify an operation in these cases, is a question on which no opinion can be offered at the present time.

Fractures of the Base.—Cushing says, " Possibly no one of the recent contributions to the surgery of the head has proved so simple or has been so satisfactory as the decompressive measure, whether unilateral or bilateral, for basal fractures." He reports twelve new cases of intervention for birth hæmorrhages. About half of these patients succumbed during or soon after the operation, but some made excellent recoveries without paraplegia. He states that the procedure is a delicate and difficult one, and that at present he does not feel that it can be widely advocated for general use.

Lombard[6] has recorded a case which shows that even after infection has supervened on a fracture of the base, life may sometimes be saved by operation. The patient about whom he writes was a boy of nine years who developed a meningitis following head injury, the infection being demonstrated by lumbar puncture. The skull was opened in the left temporal region, and a considerable quantity of turbid fluid escaped on incising the dura mater. Drainage was established, and six weeks later the patient had completely recovered.

Epilepsy.—The surgical treatment of epilepsy, particularly of the so-called idiopathic form, is still under discussion. The types of operation suitable for various cases are by no means settled, but a number of records are accumulating showing that decompression is able to influence the attacks favourably in many cases.

Weil[7] has studied some twenty cases of both the Jacksonian and the essential types operated on at the Breslau clinic. He concludes that surgical treatment is indicated, (1) In all cases of traumatic origin; (2) In cases of generalized epilepsy of traumatic origin; (3) In cases of generalized epilepsy when there is a cranial osseous cicatrix; (4) In non-traumatic Jacksonian epilepsy; (5) In cases of generalized epilepsy which are complicated by paralytic phenomena, particularly when at the beginning of the disease the convulsions were localized; (6) In essential epilepsy when medical treatment fails. Weil refers particularly to the so-called method of Kocher, which consists in the relief of endocranial pressure by the removal of portions of the skull. He questions the theory that hypertension is the essential cause of epilepsy, but seeing that the epileptic attack is associated with hypertension, it is not surprising to find that the method has given good results in some cases, and it has the merit of simplicity.

Bircher[8] reviews fourteen cases of epilepsy treated by operation. The four cases which were followed by recovery were all attributable to injury. The most interesting point of the paper is the discussion as to what should be done to the brain when the cortical area concerned has been exposed. He concludes that in place of the excision of cortical centres, massage of the area involved for some five minutes is preferable. There results from this massage certain atrophic processes in the cortex, and these were demonstrated at the autopsy of a man twenty-four years of age who was treated in this way; he improved for eight or nine weeks, dying subsequently in the status epilepticus. The subject is an interesting one, but further evidence is required for an opinion on its value.

Zimmermann[9] writes on the operative treatment of so-called essential epilepsy. Among fifty-six cases of essential epilepsy he found five belonging to the class which Horsley calls focalized epilepsy; that is to say, in which the attack begins always in the same part of a limb, to become general subsequently. He operated on four of these, and obtained three recoveries and one improvement. In the last case the patient, who before the operation had had about twenty fits a day, had two or three slight attacks at the end of nine months, and his psychical

condition was greatly improved. In another case, the subject of epileptic dementia with focalized convulsions, the wound required plugging in part, in consequence of hæmorrhage from the longitudinal sinus ; the patient tore off his dressing, and died in consequence from meningitis on the eighth day.

Zimmermann has also operated on three cases of diffuse essential epilepsy, trephining on the right side. Following the operation the attacks became rarer, shorter, and less violent, and were confined to the right side, disappearing on the left. One of these patients was trephined a second time on the opposite side at the end of three weeks, and the convulsions on the right side also disappeared. The operation in all these cases consisted in the reflexion of a large osteoplastic flap over the precentral convolutions. In three of the cases of focalized epilepsy, cortical centres were excised according to the method of Horsley. In the other two focalized cases, and in the three cases of diffuse epilepsy, he practised massage of the cortex, as suggested by Bircher. The excisions were followed by paralyses or pareses, whilst the massage of the cortex produced no such functional trouble. In all cases the osseous flap was reduced in size to assure decompression of the brain. These cases were all of comparatively recent date at the time of report, but Zimmermann concludes that in essential epilepsy, at any rate in its focalized form, operation may give encouraging results.

Mych[10] also writes on the treatment of focal lesions by the method of cortical massage. He considers that it has the double advantage of producing less trauma than excision, and of being capable of application over a larger area of cerebral substance. He suggests that in cases of generalized epilepsy the whole of the motor cortex might be massaged. In two cases which he related the results obtained were not encouraging. The first concerned a boy of seventeen years afflicted with essential epilepsy, the first attack dating from the age of eleven. At the beginning of 1909 he had three or four attacks a day. Kocher's decompressive operation was then performed, and the attacks diminished in frequency, at any rate temporarily. On January 21, 1910, a further operation was undertaken. As the attacks commenced with a motor aura in the right hand, the left mortor cortex was exposed and massaged. The patient was only under observation for about four weeks subsequently ; by the end of that time he had already had two seizures. Two consequences of the operation, however, were striking : the first was the immediate appearance of paralysis of the right upper limb, a paresis of the right half of the face, and troubles in articulation ; the second was the apparent ill effect on the patient's psychical condition.

The second case concerned a patient aged 22, presenting epilepsy of the Jacksonian type. The operation was done in two stages ; massage of the cortex was performed for three minutes ; neither paralysis nor paresis supervened. The operation was absolutely without result on the epilepsy, but appeared to be responsible for certain

psychical disturbances of a very definite nature. Further experience only can show whether the onset of these phenomena was a coincidence or not in these cases.

Rostié[11] reports on a point of technique, the use of a hernial sac to replace a defect in the dura mater, in a case of Jacksonian epilepsy. The patient, aged 28, had been the subject of a compound fracture of the skull, and convulsions subsequently supervened. The convulsions commenced with a tonic contraction of the right arm and leg. There was a defect of the dura mater measuring $2\frac{1}{2}$ by 3 cm.; a piece of fresh hernial sac was sewn in position to replace this. He discusses the advantages of such a grafting, and considers it compares favourably with any other material which has been suggested.

Lumbar Puncture in Cerebral Tumour.—Two further cases are recorded showing the danger associated with lumbar puncture in tumour of the brain. Hamburger[12] reports that of a woman aged 48; 14 c.c. of cerebrospinal fluid were removed under feeble pressure. The patient became comatose eight hours later, and died in cyanosis thirty-seven hours after the puncture. At the autopsy the medulla was found jammed in the foramen magnum, and showed by the marks on its surface the pressure to which it had been subjected. Spiller[13] writes of a case of sudden death from cerebral hæmorrhage after lumbar puncture; the case was one of cerebral aneurysm and not of true tumour. His complaint was chiefly that of headache of a severe type. Cerebrospinal fluid was removed for diagnostic purposes. Within a few minutes afterwards the patient cried out and lost consciousness, and died in two and a half hours. At the autopsy there was a large quantity of blood distributed generally beneath the dura. The aneurysm showed a point of rupture.

Acquired Hydrocephalus.—Bruce and Cotterill[14] record a case of considerable interest; a girl, aged 10, in August, 1908, had an attack of posterior basal meningitis, followed by recurring crises of headache and vomiting, with gradual loss of vision and optic neuritis. Frequently there was loss of control over the rectum and the bladder, with extreme feebleness of the left leg and subsequently of the right. The state of stupor increased, and the cranial sutures became separated by the increase of endocranial pressure. Cotterill first punctured the lateral ventricle through the right parieto-occipital suture. About 120 c.c. of fluid were withdrawn without any marked improvement in the patient's condition. He then resected a large part of the occipital bone and reopened the foramen of Magendie, which was obliterated by fibrous tissue. After this, gradual amelioration set in, and by degrees there was a complete recovery in the motor power, the vision, and intelligence, and the disturbance of the sphincters disappeared.

Acromegaly.—The following five new cases of operation on the pituitary body for acromegaly have been recorded; all were operated on by the nasal route. Rose[15] reports that of a man, aged 43, with the typical symptoms of the disease of seven years' duration. Bulging through the posterior wall of the sphenoidal sinus was a

swelling covered by dura mater. On incision of the dura mater some soft tissue bulged and was removed with a curette. Histologically the substance removed showed the structure of a benign adenoma. Changes in the limbs were observable soon after the operation, and the cerebral activity of the patient was notably improved. The final result of the case is not known.

Hirsch[16] has reported three cases recently operated by his endo-nasal route: (1) A woman, aged 57: under local anæsthesia the nasal septum was removed and the sphenoidal sinus opened. On incising the dura mater a quantity of fluid escaped, there was no trace of tumour, and apparently the case was one of cyst. A notable improvement in symptoms followed this operation, in regard both to vision and to the changes in the limbs, the skin, and subcutaneous tissue. (2) A woman aged 29 years. By the same method a portion of tumour tissue was removed, of whitish colour on section, and showing an adenomatous structure; again there was an improvement in symptoms. (3) A man, aged 36, died eight days after the operation from pneumonia. The symptoms were of the so-called adiposo-genital type, with marked alterations in vision. The tumour was histologically a squamous-celled carcinoma with extensions at the base of the brain which could not have been eradicated by operation.

Bode[17] publishes observations on what he states was the forty-third case of operation for hypophyseal tumour. He chose the nasal route, but followed Schloffer in opening up the frontal sinus. On incising the dura mater a soft mass of growth was removed, which proved to be adenomatous in structure. A month after, the symptoms were all greatly ameliorated, but three months later the condition was much the same as before the operation. The wound was re-opened and the tumour removed anew with the curette. The patient developed a parotitis and died in fourteen days. At the autopsy it was found that there was a considerable intracranial extension of tumour growth, and histological examination showed that its real structure was that of an epithelioma developed from the glandular part of the hypophysis. Bode discusses the question whether the operability of these hypophyseal tumours can be estimated before operation. He states that in his patient the slowness of the development of symptoms, the enlargement of the sella turcica, the absence of signs of general increase of pressure within the cranium, had led him to expect an encapsulated tumour confined to the region of the hypophysis. The autopsy showed, however, that this was not the case.

Schmitt[18] discusses the methods for gaining access to the hypophysis. On anatomical grounds he points out that the most direct route is by reflexion of the nose downwards and the removal of a wedge-shaped section of the septum. His method is shown in the accompanying illustrations (*Figs.* 49, 50).

Tumours of the Cerebello-Pontine Angle.—Tumours of this region are of particular interest to the surgeon, in that they usually prove to be circumscribed growths, total removal of which is possible although

access to them is difficult. Clinically, these growths produce the symptoms of cerebellar tumours, but are characterized by a unilateral deafness of nervous type, with paresis or paralysis of other cranial nerves on the same side. Leischner[19] reports ten cases of this character operated on by von Eiselsberg and his assistants. The first of these was operated on by resection of the mastoid and exposure of the cerebellum by an osteoplastic flap. The patient died from shock at the end of forty-eight hours. In the other nine cases the method of Krause was followed, and the operations were done in two stages ; in the first stage the bone was removed from the posterior fossa extending well on to the mastoid process on the side where the tumour was situated. Von Eiselsberg considers that removal of the posterior border of the foramen of magnum is dangerous on account of its nearness

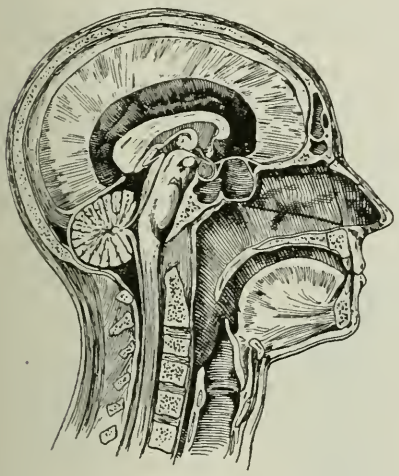


Fig. 49.
Lines of septal resection.

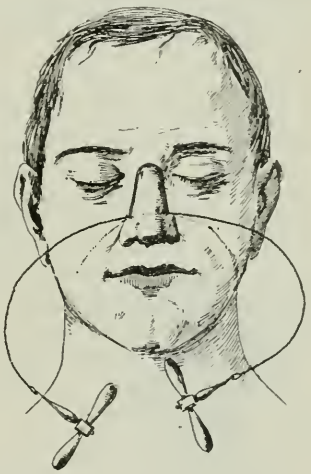


Fig. 50.
External incision and line of saw section.

to the bulb, and in the two cases in which he did this, death followed rapidly, with bulb symptoms. The second stage of the operation was done in from six to nine days. The dura mater was incised, the cerebellum displaced, the tumour exposed and removed. None of these operations was complicated by hæmorrhage. The results of the ten operations were as follows : Six patients succumbed : two after the first stage, from shock and paralysis of the vagus ; two others soon after the second stage, and the other two later, one from meningitis and the other with a process of softening in the cerebellum. The remaining four cases recovered ; two were too recent in date to judge of the effect of the operation. The others were reported eight and fourteen months after operation, and were improved so that they had been able to return to work ; the deafness persisted, but the paralyses

of the other cranial nerves and the alterations in vision had considerably lessened.

Leischner collected forty-four cases of operation for tumours of the character he describes, with twenty-nine deaths, a mortality of 70 per cent.

REFERENCES.—[1]*Centr. f. Chir.* 1910, Dec. 3; [2]*Ann. Surg.* 1911, July; [3]*Johns Hop. Hosp. Bull.* 1910, Nov.; [4]*Deut. med. Woch.* 1911, May 4; [5]*Jour. Amer. Med. Assoc.* 1911, 1803; [6]*Prov. Méd.* 1911, 65; [7]*Beitr. z. Klin. Chir.* 1910, 639; [8]*Rev. Suisse de Méd.* 1911, 155; [9]*Centr. f. Chir.* 1911, 45; [10]*Chir. Archiv. Veliam.* 1911, xi. 256; [11]*Wien. klin. Runds.* xxv. 6, *et seq.*; [12]*Surg. Gyn. and Obst.* 1910, 565; [13]*Deut. militarartz. Zeits.* 1911, Feb. 20; [14]*Lancet*, 1910, ii, 1419; [15]*Chirourgia.* 1910, 160, 96; [16]*Wien. klin. Woch.* 1911, 109; [17]*Deut. Zeits. f. Chir.* 1911, 480; [18]*Ann. Surg.* 1911, 44; [19]*Mitteil. a. d. Grenzgeb. d. Med. u. Chir.* xxii. 675.

BREAST, CARCINOMA OF. *W. Sampson Handley, M.S., F.R.C.S.*

At the French Association for the Study of Cancer,[1] a discussion took place on the advisability of removing the great pectoral muscle in cases of breast cancer. M. Renaud maintained the uselessness of removing this muscle, and quoted in support of his opinion a case where a recurrent nodule, adherent to the intact great pectoral, and not adherent to the skin, was separated from the muscle fibres by a microscopic layer of fibrous tissue! Delbet, Lucas-Championnière, and Schwartz opposed the removal of the muscle unless the growth was adherent to it, stating that they had never seen recurrence in the muscle. Walther pointed out that Renaud's specimen showed the impossibility of removing the whole of the pectoral fascia unless the great pectoral (its clavicular portion excepted) is removed. Following these principles, and more recently Handley's work on the spread of cancer, M. Walther is able to point to a series of forty-four cases from 1889 to 1909, among which only two local recurrences at the site of operation have taken place, while twenty-eight of the patients remain well.

A few months later Pierre-Nadal showed a specimen of miliary carcinoma of the great pectoral muscle, secondary to breast cancer. The discussion leaves the impression that the surgery of breast cancer in France has not kept pace with pathological advances in other countries.

X-rays advocated in treatment of Cancer (*page* 75) and of Paget's disease (*page* 77), **Radium** (*page* 79), and **Ionization** (*page* 97).

REFERENCE.—[1]*Jour. de Chir. passim.*

BREAST, CHRONIC TRAUMATIC MASTITIS OF.

Priestley Leech, M.D., F.R.C.S.

Lenthal Cheatle[1] calls attention to this condition. Non-operative treatment has sufficed to remove it. Puncture of the inflamed nodules in two cases showed no micro-organism either in a blood-film or in growth on nutrient media. One or both breasts may be affected, but both are more commonly diseased. The condition is

usually worse at menstrual periods. There are painful and tender lumps in the breast. These are usually situated in the lower and outer parts of the breast, but not infrequently they may be found in the extension of the gland towards the axilla. The lumps do not adhere to the skin, and no enlarged lymphatic glands can be felt. It is caused by the whalebones or steels of the corset digging into the breasts (*Figs.* 51–54). The first step is to alter the corsets. He has also seen cancer of the breast in the site where the stay bones press on the gland. Contrary to many English and

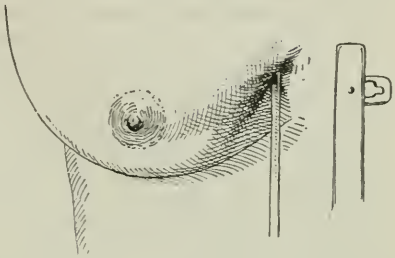


Fig. 51.

Fig. 52.

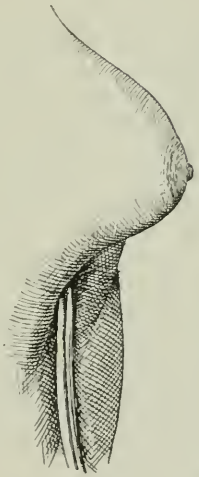


Fig. 53.

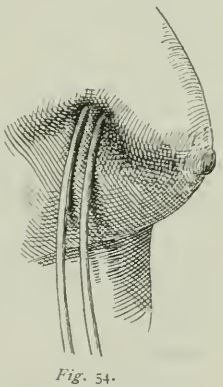


Fig. 54.

American surgeons, he does not think that chronic mastitis is frequently associated with or precedes cancer.

(For **Vaccine** treatment, of mastitis, *see page* 62.)

REFERENCE.—[1]*Brit. Med. Jour.* 1911, Mar. 4.

BRILL'S DISEASE. (*See* TYPHUS FEVER *and* PARATHYROID FEVER.)

BRONCHITIS. *J. J. Perkins, M.B., F.R.C.P.*

ETIOLOGY.—Madison[1] calls attention to the frequency with which chronic or recurrent bronchitis is due to the presence of *B. influenzæ*. The main features of the cases he reports were cough of some years' standing, with frequent febrile exacerbations leading to extensive bronchitis, or even broncho-pneumonia. In one instance these attacks

had lasted for eighteen years, and in others the recurrent bronchitis and chronic cough had led to a condition of bronchiectasis. In some of these cases the influenza bacillus was so much more numerous than the other pathogenic organisms present, that it could be considered a practically pure infection. More often, however, other organisms were so combined with it that it evidently would not always be easy to say which was the predominant agent. Madison quotes in this connection the work of Lord, who found that in sixty-four of these cases a mixed infection was present, but that in 59 per cent the influenza bacillus was present in varying numbers. Of sixty-six cases of comparatively pure infection, the influenza bacillus was the responsible organism in forty-seven instances.

TREATMENT.—The bearing of these cases on the possibility of the **Vaccine** treatment of bronchitis advocated by Latham,[2] who reports a series of cases from which great benefit resulted, is evident. His verdict as regards the method is that it has added greatly to our power to alleviate the attacks and diminish their frequency and severity, but that it is beyond our power in most instances to exterminate the invading organism. In spite of this, in his experience vaccine therapy is often of great value in the treatment of bronchitis. He gives instances of cases in which the active organisms were *streptococci*, *micrococcus catarrhalis*, and *pneumococci*. He believes in small doses of the vaccine, the initial dose in several instances being one million and the final 6, 10, or 20 million. In case it is not possible to determine the active organism, he believes in trying successively the effect of vaccines of the different organisms present, until, by a process of exclusion, he finds which is the effective one. The dose and the spacing of the doses are to be decided by consideration of the physical symptoms and temperature. Administration by the mouth can be employed provided the stomach is healthy, but care must then be taken to give the dose in a little normal saline on an empty stomach, e.g., an hour before breakfast. Even where marked improvement has occurred, it is advisable to give a few prophylactic doses at intervals of six or twelve months.

Ichthyol (*page* 19) during convalescence from acute attacks. **Ocean Sanatoria** (*page* 27). **Oxygen** (*page* 29).

REFERENCES.—[1]*Jour. Amer. Med. Assoc.* 1910, Aug. 6; [2]*Pract.* 1910, Dec.

BRONCHO-ŒSOPHAGOSCOPY. *George L. Richards, M.D., Fall River.*

Yankauer[1] reports cases of removal of (1) two pieces of peanut kernel from the right bronchus of a sixteen-months-old child, with recovery; (2) a brass pin, 1½ inches long, from the right bronchus of a boy four years old, by bending the pin double with a hook, also with recovery; and (3) a prune-stone from the left bronchus of a twelve-year-old girl after eight months. This last case is of interest because of the difficulty in finding the lumen of the left bronchus, which was completely obliterated by swelling of its mucous membrane. Recovery.

He also records four cases of removal of foreign bodies from the œsophagus, with the aid of the œsophagoscope. Two coins and one

toy rooster made of lead were successfully removed from the upper œsophagus of young children, and a sharp piece of brass from the œsophagus of a four-year-old boy. In this last case there was extensive laceration of the posterior wall, and the boy died several days later.

REFERENCE.—[1]*Ann. Otol. Laryngol. and Rhinol.* 1910, 719.

BRONCHUS, FOREIGN BODY IN. (*See also* BRONCHO-ŒSOPHAGOSCOPY.)

J. J. Perkins, M.B., F.R.C.P.

Fowler[1] gives his experience of the extraction of metallic bodies from a bronchus by means of instruments constructed on the principle of the telephonic probe of Girdner. The train of symptoms which follows the impaction of a body in the bronchus depends, according to Fowler, partly on its size, but more especially on whether it is hollow or solid. In the case of hollow bodies, such as tracheotomy tubes, the body, as he remarks, forms practically an intubation tube, and symptoms of dyspnœa are consequently absent. In Fowler's cases on this account the presence of a foreign body was hardly suspected until it was verified by the *x*-rays.

At the operation, which started with a preliminary low tracheotomy, the evidence gained by radioscopy was confirmed by a **Telephonic Probe.** The instrument was improvised by means of the ordinary Bell receiver of the telephone system, a sound-gauge serving as a large metallic electrode; a long silver probe of the common pattern, and a pair of conducting cords from the battery in the ward completed the apparatus. The circuit through the telephone was completed by moistening the plate with a solution of common salt and pressing it firmly against the surface of the chest wall.

Through the tracheotomy wound the improvised probe was passed into the bronchus, and a characteristic grating sound heard in the receiver held to the surgeon's ear by an assistant announced that the probe was passing over the inner surface of the lost tracheotomy tube.

The probe was then withdrawn and a flexible throat forceps substituted for it in the telephonic circuit. Again a grating sound announced contact with the tracheotomy tube; the forceps were then closed, and the tracheotomy tube was withdrawn.

Newton Pitt[2] summarizes the *results* of obstruction of a bronchus by a foreign body, which are such as to make it necessary immediately to remove a foreign body even if at the moment it is not giving rise to any urgent symptoms. As a result of obstruction, the bronchus becomes filled with retained secretion which is unable to pass out as it normally should; dilatation then sets in, with secondary changes in the lungs, in connection with which septic pneumonia and gangrene may develop, complicated by pleurisy and empyema.

REFERENCES.—[1]*Ann. Surg.* 1910, Dec.; [2]*Lancet*, 1910, Dec. 10.

BUBO.

(*Vol.* 1911, *p.* 226)—(1) Treat the cause: e.g. chancroids should be cauterized. (2) Open the bubo by an incision through healthy tissue, about 1½ in. below the swelling. (3) Express pus, curette the cavity, and irrigate it with 1–2000 perchloride solution. (4) Fill the cavity with iodoform (10 per cent) vaseline.

BURNS.

Picric Acid a good local application (*page* 33).

CAISSON DISEASE.

(*Vol.* 1911, *p.* 236)—The only efficient treatment is prompt **Recompression** in a special chamber.

CANCER. *W. Sampson Handley, M.S., F.R.C.S.*

Etiology.—Sir Henry T. Butlin,[1] in two lectures entitled "Unicellula Cancri, the Parasite of Cancer," has emphasized and extended his previous view "that the carcinoma cell is an independent organism, like many a protozoon; that it lives as a parasite in the body of the animal which is affected with carcinoma, deriving its nourishment from this host, and doing nothing to repay the host for the sustenance of which it robs him." He claims that the carcinoma cell is an independent unicellular protozoal organism of new creation, derived originally from the cells of its host, but subsequently living its own life in the tissues of its unwilling host, just like the parasitic protozoa of extrinsic origin, e.g., the trypanosomes. The lecturer pointed out that phenomena of dissemination, ulceration, lymphatic obstruction, and long latency followed by recrudescence of the disease, occurred both in protozoal infections and in cancer, and that the cancer cell fulfils Koch's postulates for the pathogenicity of a micro-organism. He demands for the cancer-cell that it should be recognized by the zoologists as a separate family of unicellular organisms. And since the biologists refuse it room among the protozoa, he attaches to it the name *Unicellu'a cancri.*

This latest of Butlin's many contributions to our knowledge is an arresting and valuable one; but until cancer cells have been cultivated through many generations outside the body, it would seem unnecessary to confer brevet rank upon them by the zoological name *Unicellula cancri.*

These lectures deal a further blow to the extrinsic parasitic theories of cancer origin. The view that cancer depends upon an external parasite is perishing of inanition, and can only be revived by the advent of new facts.

Bond,[2] of Leicester, believes that cancer must be regarded as an adaptive response on the part of certain cells or cell-groups to environmental change, and as the result of a process of variation and selection among the cells of the organism. The paper, though too theoretical to be abstracted here, is a striking contribution to the subject.

Cultivation in vitro of Cancerous Tissues.—Carrel and Burrows,[3] of New York, have initiated a new departure in cancer research by cultivating *in vitro* fragments of sarcoma, or of normal tissue, or of embryonic tissues (chick embryos), on a medium consisting of blood plasma of an animal of the same species. There would appear to be no doubt that the effects observed indicated actual growth of the tissue fragments, and not merely degenerative swelling, for in one experiment the area covered by the new cells within twenty-four hours was almost

forty times that of the original fragment. This interesting method may prove to be of great value.

The human sarcoma cultivated by Carrel and Burrows was removed by Coley from the right fibula of a woman aged thirty-five. During the operation, a little blood to be used as a medium was taken from the arm of the patient, and fragments of the tumour were incubated in it for sixteen hours. At the end of this time round and spindle cells were observed with the microscope wandering from the tumour fragment through the serum. The following day similar phenomena were observed. On the fifth day most of the cultures were dead.

Lambert and Hanes,[4] of New York, have observed amœboid movement in the cells of rat and mouse sarcoma grown *in vitro* by Burrows' technique.

Carrel and Burrows have found that the plasma of a sarcomatous fowl, while inhibiting the growth of fragments of an implanted sarcoma of the same strain derived from another fowl, has a stimulating effect on the growth *in vitro* of normal tissues and of fragments of the animal's own sarcoma. A serous extract of the sarcoma conferred on normal blood plasma the stimulating effect of sarcomatous plasma. Embryonic spleen was especially sensitive to the effect of sarcoma extract, and grew very rapidly under its influence.

Ross's Theory.—H. C. Ross,[5] with S. W. Cropper and C. Macalister, has carried out extensive experiments upon substances which he calls "auxetics" and "augmentors," and bases on these experiments a new theory of the pathogenesis of cancer.

He defines an *auxetic* as a substance which has the power of inducing cell-division; while an *augmentor*, though in itself powerless to produce cell-division, accelerates and increases the action of auxetics. The principal auxetics are extracts of organs, substances therefore which may occur naturally in the process of katabolism. Augmentors generally have the composition of alkaloids, and among them are the cadaveric alkaloids which result from the action of putrefactive organisms.

Ross's fundamental experiment is that when a living human lymphocyte is submitted under proper conditions to the action of auxetics, it exhibits amœboid movements, extrudes pseudopodia, exhibits nuclear division, and then, in a few minutes, dies.

The observations have been carried out on living human cells (leucocytes) suspended in citrate solution and examined in contact with a film of agar jelly. In this jelly are incorporated (1) Certain salts to give it the proper "coefficient of diffusion"; (2) If desired, a proportion of polychrome methylene blue, itself an auxetic, to stain the cells; and (3) The substances whose auxetic or augmentor properties it is desired to investigate.

These observations are connected with cancer by the following chain of reasoning:—

The blood of a cancer patient or the juice of a cancer is said to produce marked auxetic effects on leucocytes. Normal blood serum does not markedly stimulate amœboid movement.

There is an intimate association between chronic irritation and the onset of cancer. "Irritation" means cell death, and cell death sets free auxetic substances such as globin, kreatin, and xanthin, which act upon the neighbouring connective tissue cells and cause them to proliferate. The action of these substances may extend to the epithelium. Ross claims to have witnessed nuclear division in an epithelial cell submitted to the action of powerful auxetics. The action of products of katabolism and cell death is powerfully stimulated by the presence of certain "augmentors"—atropine for example, and the alkaloids choline, cadaverine, etc., which result from putrefaction. If cell death at a focus of chronic irritation is associated with putrefaction, the normal reactive epithelial proliferation may pass the limits of innocency under the additional stimulus of the alkaloidal substances produced.

Ross has found that the action of natural auxetics is inhibited in the presence of blood serum. The restraining body in serum is thermolabile, and it does not combine with the auxetics. Consequently a mixture of serum with an auxetic, when heated, recovers its auxetic power.

The views of Ross are open to criticism in various directions. For instance, it has been suggested that the appearances observed are simply the death struggles of the leucocyte, and I believe most cytologists are still unconvinced on this point. As applied to cancer, the theory has at present no very solid foundation of laboratory work, and is largely hypothetical. Nevertheless, it supplies much food for reflection and scope for future experiment. It would fall into line with the well-established work of Starling on the hormones, chemical substances which can excite the secretory activity of glandular epithelium.

It will be seen that in Ross's view two main factors are necessary to the production of cancer. In the first place, the tissue in which it arises must be one in which katabolic changes predominate or cell-death is occurring. This is the reason why cancer is a disease of old age.

The second main factor is the presence of augmentors in the tissue, and Ross points out that at the common seats of election of a cancer, e.g., in the mouth, and the cervix uteri, putrefactive or septic processes which are known to produce augmentors are especially frequent.

Heredity.—Bashford[6] has shown that *heredity* plays a part in the development of spontaneous cancer of the breast in mice. At all ages the disease was more frequent when the mother, or either grandmother, or all three of these ancestors, had died from cancer of the breast. The age of maximum incidence is, however, no lower in mice of cancerous ancestry than in those free from hereditary taint. An important fact noted is that transplanted cancer is no more likely to grow in mice with a cancerous family history than in mice of healthy stock. The hereditary predisposition to cancer, therefore, does not consist in a fitness of soil for the reception and nutrition of cancer cells, but rather

in a local peculiarity of the mamma, a readiness on the part of its cells to become cancerous.

Cancer Mortality.—The returns of the Registrar-General for the years 1901 to 1909[6] show an increase of cancer during this period, unequally distributed over the various organs of the body. In males the main increase fell upon the alimentary tract, and especially upon the stomach. The increase in females, while mainly affecting the stomach, was shared by the breast. The mortality from cancer of the generative organs has not increased at the same rate as that from cancer of other organs. The increased mortality from cancer mainly affects the higher age-periods. The last observation is important, as showing that the increase in cancer is partly due to the general increase in longevity.

Cancer Houses.—In Paris, during about three and a half years ending 1909, Juillerat[7] found that 9953 deaths from cancer occurred in 8675 houses, well spread over the whole of the city. As regards multiple deaths in private houses: in each of 817 houses 2 deaths occurred; in 91 houses 3 deaths; in 8 houses 4 deaths; in 2 houses 5 deaths.

Since some of the houses enumerated in this list contained as many as 400 inhabitants, it appears to offer little support to the theory of cancer houses. It is rather a striking fact that 18 per cent of the houses in which cancer occurred had been marked down by a previous investigation as active and permanent abodes of tuberculosis. Among the 7752 houses with one cancer death were 186 tuberculous houses; among 813 houses with two cancer deaths, 274 tuberculous houses; among 91 houses with three deaths, 57 tuberculous houses; among 8 houses with four deaths, 6 tuberculous houses.

Juillerat proposes to continue his investigations over a longer period, and reserves his conclusions for the present He thinks that his figures do not offer support to the theory of cancer houses, but believes that the frequent coincidence of cancer and tubercle in the same house is not accidental.

P. W. Hislop and P. C. Fenwick,[8] in a paper on the *incidence of cancer in New Zealand*, record a remarkable series of six cases occurring in persons unrelated to each other, who at different times occupied the same house, a wooden shanty situated upon a swampy level at an elevation of about 600 feet.

Natural Cure of Cancer.—Pearce Gould,[9] in his Bradshaw Lecture on cancer, brought forward some very interesting cases of apparent cure, either spontaneously occurring, or following upon oöphorectomy or the use of *x*-rays.

1. A woman, aged 52, was admitted to the cancer wards of the Middlesex Hospital in February, 1906, with advanced cancer of the uterus, invading the rectum and causing bleeding and discharge. She slowly became worse, and lost the use, first of her lower, and next of her upper limbs, from severe peripheral neuritis. In September, 1908, she improved; the uterus became more mobile, hæmorrhage and pain lessened, and movement began to return to the limbs. In

July, 1909, no ulceration or growth could be felt in the cervix or the vagina; the uterus was small and senile, with a very small vaginal cervix. A few months later she was discharged, and in December, 1910, was earning her living by needlework.

2. A nurse had her left breast removed in 1897 at Faversham. In 1898 a lump was removed from the axilla. In 1899 a recurrence in the axilla and two or three nodules in the skin were removed. Later in the year the axilla was thoroughly cleared out for another recurrence. At the last of three subsequent operations for axillary recurrence in May, 1900, the growth could not be removed. In September, 1900, when there were a brawny arm, an open ulcer in the axilla, and a firmly fixed mass below the clavicle, double oöphorectomy was done by Sir A. Pearce Gould. All evidence of the presence of growth subsequently disappeared, and in November, 1910, she was in excellent health.

3. A woman, aged 57 years, was seen for recurrent cancer of the left breast in July, 1903. Since her first operation in 1900 she had had four operations for recurrence. There was a considerable local mass, with enlargement of the third costal cartilage and deposit in the lower flap and under the arm. She was treated with *x*-rays by C. R. C. Lyster. The growths disappeared, and in October, 1910, she was quite well except for a little local ulceration, which seemed to be the effect of the treatment employed.

A number of cases of the natural cure of spontaneous mouse-cancer have been observed in the laboratories of the Imperial Cancer Research Fund.[10]

Medico-legal Relations of Cancer.—W. B. Coley,[11] of New York, has published an important paper on *injury* as a causative factor in cancer. His unique experience lends special weight to his conclusions respecting sarcoma. 970 cases of sarcoma have come under his personal observation. A definite history of injury was obtained in 225 cases, i.e., in 23 per cent. In rather more than half the cases where sarcoma followed an injury, the tumour was noticed within a month. Perhaps the most remarkable case recorded by Coley is one in which the injury was a surgical operation. A patient was operated upon for inguinal hernia, and his tissues were found quite normal. Four weeks later a rapidly growing round-celled sarcoma appeared in the scar. In nearly half Coley's cases of post-traumatic sarcoma, the growth was a bone-sarcoma. In reference to carcinoma, Coley brings forward some evidence that a single injury may cause the disease. He quotes from Segond the criteria necessary to establish legal liability when injury has been followed by a malignant tumour. (1) Proof of the occurrence of the accident in course of employment; (2) Sufficient importance or severity of the trauma. (3) The integrity of the part prior to the injury. (4) Correspondence of the tumour to the exact site of the injury. (5) A date of appearance of the tumour not too remote from the time of the accident to be reasonably associated with it. (6) Histological verification of the tumour.

In Germany, a tumour may be held to be of traumatic origin on very

slender evidence, as in the following instance. A fall with injury of the right side of the abdomen caused severe pains. A month later appendectomy revealed a perforated appendix. Three and a half years later death occurred from a cancer of the colon—held by the Imperial Office to be in causal relationship with the original accident! In this country the question of traumatic malignancy is likely to come into increasing prominence. Coley's paper sums up in favour of the plaintiff. It is possible to hold that he has not proved his case as regards carcinoma, and that the anxiety of patients to prove a previous injury may somewhat exaggerate the undoubted frequency of traumatic sarcoma.

"Kangri" Cancer.—Some years ago E. F. Neve,[12] of Kashmir, drew attention to a form of cancer occurring on the skin of the abdomen in the natives of Kashmir, and due to their habit of carrying a portable fire-basket (kangri) beneath their clothes in contact with the abdominal skin. The extraordinary frequency of the disease may be judged from the fact that 848 cases have been treated at the Kashmir hospital in a period of twenty-five years. Neve thus sums up the salient characters: "Kangri-burn cancer is a typical squamous-celled epithelioma. In the early stages the malignancy is slight; it is slow to infect glands, and is very amenable to operation. In late cases deep glands are involved, and in many, owing to adhesions and brawny infiltration of the skin and cellular tissue, it is inoperable. In many cases its origin is in scar tissue. It is demonstrably due to a definite cause, namely, irritation from the constant application of heat. In this respect it is similar to other epitheliomata resulting from mechanical, chemical, or thermal irritation. The nature of the cause is opposed to a parasitic theory of origin, and favours a trophic theory of cancer."

Mouse-cancer.—The study of mouse-cancer in the laboratories of the Imperial Cancer Research Fund and elsewhere has been energetically carried on, and its literature is now so large that an abstract cannot possibly be given here. The subject may be of great potential importance, though it has at present no practical application to the therapeutics of human carcinoma. Bashford[13] has recently described some experiments on mouse-cancer communicated to him by Wassermann. Arguing that tumour cells, owing to their rapid growth, would be specially sensitive to any interference with their oxygen supply, Wassermann further thought that such an interference might be caused by a selenium compound. After repeated experiments, a combination of selenium and eosin was selected, the eosin acting as a carrier for the selenium. When this substance is injected intravenously the skin is at first coloured pink, but in a few hours the colour disappears from the skin and the tumour alone is found to be deeply stained. After repeated injections, the tumour disappears unless the mouse previously dies. The exception is important, for the substance is a dangerous poison. In the experiments shown to Bashford it killed four out of six mice; the other two were cured. Obviously in its present stage the method has no application to human cancer.

Effects of Radium on the Blood.—Helen Chambers and Sidney Russ,[14] working at the Middlesex Hospital, have shown that the α radiations of radium produce certain blood changes. The red corpuscles are hæmolysed, and oxyhæmoglobin is converted into methæmoglobin. Leucocytes undergo marked degenerative changes, and opsonin and complement are gradually destroyed, almost completely disappearing within forty-eight hours. These observations are of interest in connection with the radium treatment of cancer. *x*-rays also possess the power of destroying Altmann's granules.

Altmann's Granules.—Beckton,[15] at the Middlesex Hospital, has continued his interesting work on Altmann's granules, with special relation to their value in the diagnosis of cancer. These granules are present in the cells of nearly all normal tissues except unstriated muscle, squamous epithelium, and the pyramidal portion of the kidney. In the cells of malignant growths, on the contrary, whether carcinomatous or sarcomatous, they are absent or few in number. Further work has shown that these granules are acid in reaction, and of protein composition. Tissues to be examined for Altmann's granules to determine the question of malignancy, should be placed, immediately after excision from the patient, in Müller's solution containing 2 per cent of commercial formalin, or if this is not available, thin slices of the material may be put into ordinary formalin and transferred to the formol-Müller solution within a day or two. The sections are stained with aniline-acid-fuchsin, and differentiated by picric acid alcohol, which leaves the granules stained while discharging the colour from the rest of the section.

The Urine in Malignant Disease.—Elsie M. Royle[16] has continued her valuable work on the urine in cancer. She thus summarizes her conclusions up to the present: It appears that an examination of the urine will prove of great value as an aid to diagnosis in obscure cases of cancer, especially in cancer of the alimentary canal and abdominal organs, which is often difficult to distinguish from such diseases as gastric ulcer, tubercle, gall-stones, etc. In order to apply this test it is necessary to estimate the uric acid and phosphate content of the urine, to consider the figures separately, and then take into account the ratio of phosphates to uric acid.

Miss Royle considers it established that (1) In cases of cancer the uric acid is usually higher than is found in healthy cases under similar conditions; (2) The output of phosphates in the urine is in the majority of cases of cancer decreased when compared with that of healthy individuals; (3) The ratio of phosphates to uric acid is almost invariably reduced in malignant disease below that found in health, any ratio below four being suggestive, especially if it remains low on several occasions, and any ratio below three is almost diagnostic of malignant disease or of a blood disease, unless, indeed, further work proves that the same is found in other conditions.

Elsberg's Skin Reaction.—Crile and Weil have stated that the serum of cancerous patients possesses the power of "laking" normal red

blood corpuscles. They do not now claim that the reaction is specific. Elsberg attempted to obtain this hæmolytic reaction in the living patient. He injected 5 min. of a 20 per cent solution of normal washed red corpuscles into the subcutaneous tissue. When the reaction is positive a raised tender area about an inch in diameter appears within a few hours. This area takes on a brownish tinge, changing to a maroon or a dirty greenish yellow. After twenty-four hours these appearances gradually fade. Risley[17] attempted to confirm these results, but he arrived at the conclusion that the test is valueless for distinguishing cancerous from non-cancerous patients. It is often absent in cancer, often present in non-malignant cases.

TREATMENT. — **Arterial Ligature.** — Bainbridge,[17] of New York, advocates *tying the ovarian and internal iliac arteries* of both sides in selected cases of inoperable uterine cancer. The median sacral artery, if of any size, is also tied, and the ovaries, wherever possible, are removed. Enlarged abdominal glands, if present, are also removed, and the growth is subsequently curetted per vaginam, a procedure rendered safe by the ligature of the arteries. Of twenty-four cases thus treated, three died within a few days of the operation. In fourteen cases hæmorrhage was present before the operation, and in every case it was checked. In twenty cases there was improvement in the symptoms, In ten cases the growth appeared to be retarded. The period of survival varied from seven weeks to fifty-two months, and eight patients lived more than eight months.

Arterial ligature, which is a palliative only in carcinoma, may actually cure a sarcoma. About seven years ago I operated upon a case of angio-sarcoma of the broad ligament. Finding it irremovable, I ligated the ovarian and the uterine artery on the affected side. The tumour disappeared. The patient remained well for four years, and is probably living yet. The diagnosis was verified by the microscope.

Placental Blood Serum.—During the past year the writer and Melville Young have used subcutaneous injections of human fœtal blood serum obtained from the placenta and carefully tested bacteriologically, for subcutaneous injection in a case of inoperable squamous-celled carcinoma. The experimental nature of the treatment was fully explained to the patient. No beneficial result can be recorded. After a slight initial improvement the growth appeared to be stimulated. The method has been tried in Germany by Sticker with a similar result.

Antituman.—Antituman is a cancer remedy prepared by a reputable German firm, from whose year-book the following account is derived.[18] Its introducer, R. Oestreich, noticing that cartilage and the walls of arteries are rarely infiltrated by cancer, inferred that cartilage contained something hostile to tumour growth. He accordingly selected chondroitin sodium sulphate as his cancer remedy, and called it antituman.

The injection of this remedy subcutaneously was followed in several patients by severe pain, lasting an hour on the average, and limited to the cancerous part. The author regards this as a sure sign that

there really is a selective action of the remedy on the cancerous part. Cessation of the growth of the carcinoma, and an improvement in the general condition, are claimed. The action of the remedy was also shown post mortem by the presence in secondary nodules of many polynuclear leucocytes, and by degeneration and necrosis in the masses of cancer cells.

The author accordingly advises the further trial of his remedy, while modestly adding that it is not to be expected that a stomach or liver destroyed by cancer can be completely healed. The reader is apparently left to infer that conditions short of total destruction are curable.

The case for antituman is obviously of the most shadowy description. The relative immunity of cartilage is easily explained by the mechanical resistance which a non-vascular and homogeneous tissue must offer to infiltration. The assumption of anti-cancerous properties in cartilage is therefore purely gratuitous. The therapeutic evidence offered needs no criticism, since when allowance is made for the well-known beneficial temporary effects of suggestion and hope there is nothing left. As regards the pathological evidence, I showed some time ago that the conditions considered by Oestreich to indicate a reaction produced by the remedy—namely, round-celled infiltration and degeneration of the cancer cells—are normal events in untreated cancer. A knowledge of the natural history of cancer is obviously indispensable before the therapeutic effects of a remedy can be estimated. Such a study effectually disposes of the claims of antituman, and of a host of other remedies, among which antituman has been selected for criticism as a typical specimen.

Salvarsan used in treatment (*page* 54). **Radium** and malignant disease (*page* 80).

REFERENCES.—[1]*Lancet*, 1911, Nov. 25 and Dec. 2; [2]*Ibid.* 1911, ii, 349; [3]*Jour. Amer. Med. Assoc.* 1910, Nov. 12, and 1911, Jan. 7; [4]*Ibid.* 1911, Mar. 19; [5] "Induced Cell Reproduction and Cancer," London, 1910; [6]*Lancet*, 1910, July 23; [7]*Rev. de Méd.* 1910, 61; [8]*Brit. Med. Jour.* 1909, Oct. 23; [9]*Lancet*, 1910, Dec. 10; [10]*Brit. Med. Jour.* 1911, ii, 171; [11]*Ann. Surg.* 1911, Apr. and May; [12]*Brit. Med. Jour.* 1910, Sept. 3; [13]*Lancet*, 1912, i, 112; [14]*Arch. Middlesex Hosp.* xxiii; [15]*Lancet*, 1910, Aug. 13; [16]*Bost. Med. and Surg. Jour.* 1911, ii, 127; [17]*Woman's Med. Jour.* 1911, Apr.; [18]*Merck's Ann Rep.* 1911, 96

CARBUNCLE.

Glycerin compresses (*page* 16).

CARTILAGE DISPLACED, SEMI-LUNAR. (*See* ARTHROTOMY.)

CATARACT. *A. Hugh Thompson, M.D.*

Intracapsular Extraction.—(*See also Medical Annual*, 1901, 1907, 1910, 1911.) Many of Colonel Smith's pupils come back from India filled with enthusiasm for his intracapsular operation. One of these, Vail, of Cincinnati,[1] has published a detailed account of the method, with thirty-seven illustrations from sketches taken on the spot, and either this or Smith's own book on the subject should certainly be studied by anyone who proposes to undertake the operation without

having seen it performed several times by others. The number of surgeons who are taking it up certainly appears to increase.

Another of Smith's pupils, Miss Amy Sheppard,[2] gave an interesting account of her experiences of the operation at the meeting of the British Medical Association last July. The only real disadvantages of the operation, compared with the one usually performed, that she admits, are that it is more complicated and needs greater skill; that there is a greater liability to escape of vitreous; and that so much depends upon the capability of the assistant. On the other hand, the advantages claimed are much less liability to irido-cyclitis, sepsis, and post-operative glaucoma—also superior visual results. The fact that Smith himself has performed the operation in over 25,000 cases, and is popularizing it in America and India, is an argument in its favour. The majority of surgeons, however, who get such excellent results with the old operation, will not easily be induced to take up the new.

REFERENCES.—[1]*Ophthalmoscope*, 1911, 231; [2]*Brit. Med. Jour.* 1911, ii, 1171.

CELLULITIS, CERVICAL. *Priestley Leech, M.D., F.R.C.S.*

Reclus in 1893 called chronic cellulitis of the neck, "wooden phlegmon of the neck." It generally occurs in men over 50 years of age, whose general health has become undermined. A slowly extending, hard, board-like infiltration develops in the neck, sometimes in front, sometimes at the side. The evolution is slow; neither fever nor pain is present; after some weeks pus may form. The skin becomes a dusky wine-red colour. Powers[1] describes three cases of this disease. It may be mistaken for gumma, new growth, or actinomycosis. Sometimes no suppuration occurs. Reclus does not now consider it a definite morbid entity, but thinks that it is a form of reaction which can be provoked by any pathogenic germ, not only by the ordinary agents of suppuration, but also by the fungi (actinomycosis, sporotrichosis), the gregarines, etc. It may also occur around the abdominal viscera, especially in the right iliac fossa or around the kidney. There is generally an antecedent infection of the mouth, the pharynx, or the salivary glands. The causative micro-organisms are apt to be of low vitality, and some think that the affection is due to micro-organisms of diminished virulence. The general tendency of the disease is towards recovery, and suppuration should be encouraged by warm compresses, etc. In suitable cases excision of wide areas of board-like tissue may be practised. Tracheotomy may be needed.

REFERENCE.—[1]*Jour. Amer. Med. Assoc.*, 1911, ii, 365.

CEREBROSPINAL FLUID. *O. C. Gruner, M.D.*

Strouse[1] points out that the *Butyric Acid Test* of Noguchi is convenient and accurate, giving a positive result in **General Paralysis, Cerebrospinal Syphilis, Acute Meningitis,** and **Tuberculous Meningitis**, but a negative result in brain tumour, cerebral arteriosclerosis and psychoses. He obtains a positive result in only one-third of the cases of tabes. He considers that a cell-count is no better than a globulin test, and takes much longer time.

The Globulin Test.—On two parts of a hot saturated solution of ammonium sulphate in a test tube, float one part of cerebrospinal fluid. A white line at the junction means a positive result, and signifies the same as Noguchi's test.

Noguchi's Test.—One part of cerebrospinal fluid in a test tube is treated with five parts of 10 per cent pure butyric acid in normal saline. Boil, immediately add one part of normal soda, and boil again. A flocculent precipitate within two hours is a positive result.

Hohn,[2] in speaking of the diagnosis of **Tuberculous Meningitis** by the examination of the cerebrospinal fluid, states that if the fluid be clear after centrifuging, and contains a considerable increase of albumin, while the deposit contains chiefly lymphocytes and the polynuclear leucocytes which are present are degenerating, then the case is probably one of tuberculous meningitis, even if tubercle bacilli be not found. Normal cerebrospinal fluid, after centrifuging for a quarter of an hour, should show only two or three lymphocytes in a high-power field. In subacute **Cerebrospinal Meningitis,** it contains a number of polynuclear leucocytes which are strikingly characterized by their intact condition, so that here we find a considerable difference from the cells in tuberculous meningitis. The albumin is estimated in an Esbach's albuminometer, and if there be not enough fluid, an approximate estimation is made by adding an equal quantity of the reagent in a small test tube. Colie[3] describes a case in which *sudden death* occurred soon *after lumbar puncture.* The case was one of abscess in the brain not connected with the spinal canal, so that when the fluid was removed from the latter, the pressure in the cerebrum forced down the medulla and fatally interfered with the vital centres.

A method of determining the number of cells in cerebrospinal fluid is given by Giessler.[4] The fluid is allowed to emerge until 4 c.c. have come, and another vessel is then used to receive the drops emerging from the trochar until a further 4 c.c. have been collected. The trochar is then removed, and while an assistant is attending to the wound, 40 c.mm. of fluid are withdrawn from the second tube as quickly as possible by means of a graduated pipette, and discharged upon the surface of a thoroughly clean glass slide of special form. The procedure has to be performed rapidly in order to prevent errors from deposition of the cells in the solution. The slide is now dried, fixed in equal parts of ether and alcohol, or stained at once by Leishman's method. There are several methods of demonstrating the cells, but the one referred to is as good as any. The outline of the dried drop is marked with a blue pencil, and the cells are counted by the aid of a movable stage. The slide consists of a broad glass slip in the centre of which is a rectangle ruled into parallel lines in one direction only. Using the dry lens and the dry slide, the cells can be easily counted by following up the successive columns. The remainder of the fluid in the two tubes can be used for the other ordinary methods of examination.

These results give six to nine cells per c.mm. as a normal, and the pathological variations can be determined with certainty (no error

from subjective causes !). After use, the slide is placed in acid alcohol for a few minutes and thoroughly cleaned with a small brush. It may be examined microscopically in order to be sure that it is perfectly clean before using it again.

REFERENCES.—[1]*Jour. Amer. Med. Assoc.* 1911, i. 1171 ; [2]*Berl. klin. Woch.* 1911, 712 ; [3]*Med. Rec.* 1911, Mar. 18 ; [4]*Münch. Med. Woch.* 1911, 1917.

CEREBROSPINAL MENINGITIS. *E. W. Goodall, M.D.*

SYMPTOMS.—In an outbreak of this disease at the penitentiary colony of Aniane (Herault), L. Rimbaud[1] was struck by the fact that in four of the twelve cases which constituted the outbreak there was severe epistaxis, and that all four recovered. In three improvement set in immediately after the bleeding from the nose. In only one of the four cases was antimeningococcic serum employed. Of the eight remaining cases three were fatal.

TREATMENT. — A case of puncture of the right lateral ventricle, with injection of serum, has been reported by S. Ravaud Benedict.[2]

The patient was a youth, aged 16, who was admitted into the St. Vincent's Hospital, New York, on Oct. 4th, 1910, with cerebrospinal fever. He was suffering from a severe attack. Up to Oct. 20th lumbar puncture was several times performed, and one and three-quarter pints of fluid removed and one pint of antimeningococcic serum injected. At first the fluid drawn off was markedly purulent, but it became less so in the later punctures. On Oct. 20th it was decided to inject fluid into one of the ventricles of the brain. The dura mater was exposed by an ordinary trephining operation, at a point 1¼ in. vertically above a point 1½ in. posterior to the external auditory meatus on Reid's base line. With a large three-inch aspirating needle, as used in spinal punctures, the operator pierced the dura mater, "the needle being towards a point 3 inches above the opposite external auditory meatus." Cloudy cerebral fluid was found at a depth of 2½ in., and about an ounce and a half was withdrawn ; 20 c.c. of antimeningococcic serum were injected, and the wound was closed without drainage. There was a marked improvement in this patient's condition. Previously delirious, he became much quieter. In spite of temporary improvement, the patient became worse and died four days after the operation. At the autopsy made immediately after death, the right ventricle, into which serum had been injected, contained only a slight amount of cerebral fluid which was practically clear. Only a faint trace of previous inflammation was visible on the ependyma. But the left ventricle was full of sero-purulent fluid, like that which had been removed from the right at the operation, and the ependyma was covered with a thick purulent exudate.

From this case the author concludes that both ventricles ought to be operated upon in cases of this kind. A very full historical account of this disease, especially with reference to its treatment by **Antimeningococcic Serum**, will be found in a paper by Emil Schepelmann.[3] The author appends a copious list of references.

REFERENCES.—[1]*Med. Press and Circ.* 1910, Sept. 7 ; [2]*Jour. Amer. Med. Assoc.* 1911, Feb. 4 ; [3]*Wien. klin. Woch.* 1911, Jan. 26.

CHLOROSIS.

(*Vol.* 1911, *p.* 246)—Melland advises elimination of fluid : (*a*) By the bowel, by **Magnesium** or **Sodium Sulphate** ; (*b*) By the kidneys, by **Digitalis** with **Caffeine, Diuretin** or **Theocin Sodium Acetate** ; (*c*) By the skin, by **Jaborandi**, and **Hot Water** or **Vapour Baths**. Administration of **Iron** is always necessary.

CHOLERA. *Leonard Rogers, M.D., F.R.C.P.*

In the latter months of 1910[1] cholera was widely prevalent in an epidemic form in Russia, over 200,000 cases, with more than 100,000 deaths, having been recorded. This was the most severe outbreak in Europe since that of 1892–5. The water-supplies, which are unfiltered in the majority of Russian towns, became infected, with disastrous consequences. In Italy a considerable outbreak occurred in the South-Eastern districts and spread to the Naples province, where about 1000 deaths occurred in the autumn months. Turkey was also severely infected, the disease being spread by the movements of troops. The other principal European countries escaped with but a few cases.

Ivo Bandi[2] deals with cholera in Naples. Water was the principal vehicle of its spread, some of the aqueducts having become infected. The treatment of the disease was purely symptomatic. It has not yet proved possible to prepare an efficacious serum against the disease. Prophylactic inoculation was used only on a small scale. Sanitary precautions are the best measure against cholera.

Henry Stevens[3] reports an analysis of 326 cases of cholera at Madeira, the figures having been supplied to him by Lomelino, the medical officer of the isolation hospital. The mortality was 37 per cent in the reported cases. About 10 per cent of the patients were chronic alcoholics. Anuria of more than three days' duration occurred in only 15 cases, with 2 deaths, this very low proportion having been due to the early and regular use of **Intravenous Salines** (strength not noted). The incubation period appeared to be from a few hours up to eight or nine days. Of 206 convalescents, 20 carried the vibrio in their fæces for more than a fortnight after cessation of all symptoms. Only 6 of 350 contacts developed the disease. The lowest classes were chiefly affected, and no English suffered.

Allan J. McLaughlin[4] deals with the subject of cholera carriers, i.e., healthy persons who carry the cholera vibrios in their intestines without having any symptoms of the disease. He has never known the vibrios present for more than twenty days, while as a rule they disappear within ten days. In Manilla, during an epidemic he found 6 to 7 per cent of carriers among healthy people. There were no vibrios in their urine. Mild and atypical cases of cholera may also spread the disease. In Manilla each year during cholera prevalence the disease appeared in the very sanitary Bilibid prison; this was proved in 1908 to be due to carriers, who formed 6·44 per cent of the prisoners. After the stools of all incoming prisoners were examined for vibrios during five days' quarantine, the outbreaks ceased.

Treatment.—R. Tanner Hewlett[5] reports on a trial of **Anti-endotoxic Serum** in cholera. Salimbeni has used 50- to 100-c.c. doses of a cholera serum made at the Pasteur Institute and given intravenously together with saline solutions, and reported favourable results in Russia. [How far they were due to the serum and how far to the salines is not clear.—L. R.] The late Allan Macfadyen obtained a cholera endotoxin by triturating in the presence of liquid air, and

the writer has prepared an anti-endotoxic serum by injecting the endotoxin into horses. In St. Petersburg this has been tried in doses up to 75 c.c. intravenously in nine cases with five recoveries, so deserves further trial in larger quantities.

T. C. Rutherford[6] reports the results of a trial of **Hypertonic Salines** in a cholera epidemic in the Central Provinces, India. The mortality in 94 untreated cases was 62·76 per cent, while in 39 patients who received the hypertonic infusions it was 23·07 per cent. Four pints of a solution of two drachms to the pint of sodium chloride were injected intravenously in adults, while in one child an intraperitoneal injection was given with success. The pulse was rapidly restored, the cramps immediately ceased, and in successful cases the secretion of urine was almost immediately re-established. In cases seen in a very early stage, ½ to 1 oz. of castor oil was given, but no other drugs until convalescence was established. Nearly all the cases were in the better classes, who soon gained confidence in the method, and readily came to the hospital for treatment. The injections were given as early as possible without waiting for collapse to occur. Down Bros. have made him an apparatus for ready sterilization. He considers that his figures afford strong confirmatory evidence of the correctness of Rogers' treatment.

H. E. Drake-Brockman[7] reports favourably on the use of **Adrenalin** and **Pituitrin** in the treatment of cholera to produce vasoconstriction of the blood-vessels and thus prevent the drain of fluid from the body. In the last five of his cases, some being desperate ones, 5 min. of adrenalin in normal saline solution of a strength of 1–10,000 acted like a charm. In small doses these drugs are not likely to do harm, and they may be repeated at fairly short intervals, as the effect is often transitory. They may also be given intramuscularly, and in salines by the rectum. It has been so satisfactory in the few cases in which he has tried it, that he thinks it will greatly reduce the mortality of cholera. [These drugs have been used for the last three years in Calcutta in cholera, but without much value except in the late stages with threatening uræmia.—L. R.]

Protargol enemata are advised for trial in early stages by Cantani (*page* 37).

References.—[1]*Lancet* 1910, ii, 1507, 1789; [2]*Gaz. deg. Osped.* 1911, Feb. 21; [3]*Brit. Med. Jour.* 1911, Mar. 25; [4]*New York Med. Jour.* 1911, i, 115; [5]*Lancet*, 1909, Oct. 22,; [6]*Ind. Med. Gaz.* 1910, Dec.; [7]*Ibid.* 1910, 440.

CHORDEE.

Vol. 1910, *p.* 341)—Suppositories of **Opium** and **Belladonna**, and **Camphor Monobromate** (gr. vj t.d.s.) are recommended; also a mixture of **Potassium Bromide**, **Lupulin**, and **Camphor**.

CHOREA.

G. F. Still, M.D., F.R.C.P.

Etiology and Pathology.—Coombs[1] produces figures showing that 76 per cent of choreic cases either give a rheumatic history or show definite evidence of rheumatic constitution. He points out that choreiform movements may nevertheless be produced by various

infections, but emphasizes the specific character of Sydenham's chorea. He describes the degenerative changes in the cells of the brain, especially in those of the cortex, whilst those in the cord apparently escape. The changes in the meninges which have been described by other observers were not found by him. He considers that meningitis is quite exceptional in rheumatism. The degeneration of cerebral cells is not limited to any particular part of the cortex, so that one might expect many functions, not motion only, to be affected.

Symptoms.—Coombs describes psychical disturbance, e.g., slowness of cerebration and diminished power of mental concentration, in addition to the common lack of emotional control. Among the results of affections of cranial nuclei, he mentions the occasional occurrence of transient squint and diplopia. He also refers to corneal and pharyngeal anæsthesia, and to Langmead's observation of pupillary phenomena, notably hippus.

Sensory phenomena are certainly very uncommon in chorea. Cases are mentioned in which some diminution of tactile sense was present; hemianæsthesia of trunk and limbs was found in some, in others sensation was diminished over a still more restricted area; more or less analgesia and some diminution of corneal sensation were also noted, but all these are rarities. The disturbance of the motor system is of course the most striking feature of chorea. Coombs mentions intention tremor as present in one case. Alteration of reflexes, especially the "hung-up" type of knee-jerk, are quite common; an extensor plantar reflex was observed only in severe cases. Incontinence, either urinary or fæcal, is almost never paralytic in chorea; when it occurs it is due simply to the irregular spasmodic action of the abdominal muscles.

Barrett[2] points out that the frequency of chorea in childhood is one of the many differences between the manifestations of rheumatism in children and adults.

Jolly[3] has collected the views of a large number of German and French writers on the etiology of chorea. There is much less agreement amongst them as to the rheumatic specific infection as the cause of chorea than amongst English observers. Anton, for instance, considers that whilst rheumatism is an undoubted factor, other infective diseases are also capable of producing chorea. The view that chorea of pregnancy is a reflex result from uterine stimulation, he regards as more than doubtful, and considers that an altered state of the blood in the pregnant woman is likely to give rise to small emboli of the brain and so to produce chorea. Other observers consider that the parathyroids play an important part. Jolly himself takes the view that chorea may be determined by various causes, not all infective. He states that no one except Pianesi has yet produced chorea experimentally in animals by infection with the micro-organism of acute rheumatism. In this, like so many Continental writers, he shows that he has not studied English scientific writings, for Poynton and Paine have produced symptoms in animals which appear to be the

equivalent of chorea in the human being, by infecting them with the micro-organism described by them as the cause of acute rheumatism.

Treatment.—Chorea has been the target at one time or another of almost every variety of drug in the pharmacopœia. Coombs states that in his opinion huge doses of **Sodium Salicylate** are of no more value than moderate doses of 10 to 20 gr. every four hours, and that chorea cannot be aborted by any salicylate treatment; for even if this were a perfect specific against the infection of rheumatism, by the time treatment begins the toxins have in all probability already entered into indissoluble chemical union with the protoplasm of the cortical cells, so that any improvement must necessarily be gradual. It may, however, be true that salicylate has some preventive effect and hinders further damage. (*See also page* 37.)

Cockayne,[4] as a result of a study of 780 cases of chorea, concludes that the salicylates have no effect in preventing or checking rheumatic carditis, that they do not prevent the formation of rheumatic nodules, nor have they any effect upon the choreic movements.

Arsenic in large doses has been advocated by some writers as having altogether a more pronounced beneficial effect than the ordinary small doses. Coombs considers that the attempts to avoid the toxic effects of this drug when given in large doses are "so much energy wasted." On the strength of twenty-five cases treated with at least half a drachm of Fowler's solution per diem, none of which showed the "miraculous" results which have been attributed to this method of treatment, he concludes that large doses of arsenic have no appreciable effect upon the course of chorea. This conclusion is not borne out by the experience of many physicians, though most would agree that "miraculous results" are not to be expected from any method.

Chloretone has recently been recommended by various observers. Coombs considers that small doses of this drug actually aggravate the movements in mild cases, whilst larger doses produce a general cerebral depression which is out of proportion to the severity of the disease. He advises that chloretone should be given, in bad cases only, in doses of 4 or 5 gr. three times a day, this being cautiously increased to 8 gr. in children over ten. [This dose would certainly be excessive in some cases, as considerable drowsiness may be produced by 4 or 5 gr. in children of eight to ten years.—G. F. S.]. Coombs prescribes this drug in petroleum emulsion, and recommends inducing a sleepy state for several days.

Hot Packs have been found of considerable value, and sometimes check even severe choreic movements. This method Coombs recommends as being at any rate free from harmful effect.

Viana[5] describes some cases in which **Electrical Treatment** proved useful. As he points out, the faradic current frequently exercises a soothing influence, but in children electricity is usually to be avoided as disturbing them by causing alarm.

Roden[6] describes a case of a child, aged ten years, in whom, after arsenic treatment had failed to produce any improvement, teaspoonful

doses of the fluid extract of **Thyroid Gland** (Duncan and Flockhart), given twice a day, produced a rapid cessation of the chorea.

Salvarsan found useful by some practitioners (*page* 54).

References.—[1]*Brist. Med.-Chir. Jour.* 1911, 50; [2]*Brit. Jour. Child. Dis.* 1911, 114; [3]*Wien. klin. Woch.* 1911, July, 1046; [4]*Quart. Jour. Med.* iv. 6; [5]*Gaz. d. Osped.* 1910, 1177; [6]*Lancet*, 1910, Oct. 29.

CILIARY BODY AND IRIS, DISEASES OF. *A. Hugh Thompson, M.D.*

Iritis.—*Etiology.* So far we seem to have arrived at agreement on two points, that the importance of rheumatic fever as a cause of iritis has been grossly exaggerated, and that the rôle played by septic absorption is very great. It is further recognized that inflammation of the iris is closely connected with that of the ciliary body and choroid, and therefore with exudation into the vitreous; in fact, that inflammatory affections of any part of the uveal tract must be considered not as several affections, but as one. One of the most potent sources of sepsis causing these various kinds of uveitis is to be found in decayed teeth. An interesting light on this subject has been thrown by Goulden,[1] who gives an analysis from this point of view of 39 cases: 5 of iritis, 21 of irido-cyclitis, 4 of vitreous opacity far forward, 8 of choroiditis, 1 of panophthalmitis. "Of the five cases of iritis, syphilis was responsible for 3, gonorrhœa for 1, and diabetes for 1. Of the 21 cases of irido-cyclitis, syphilis was responsible for 4, 1 was a case of sympathetic ophthalmia, which leaves 16 cases for which a cause is to be found. . . . A search was made for a focus of septic absorption. In one case the focus found was in the tonsils, the patient improving rapidly as soon as these received attention, in spite of more than twelve months' unsuccessful treatment previously. In two cases no cause could be discovered, but in both the patients were women, and no examination was made of the uterus. In thirteen cases sepsis in connection with the teeth was present; and although not every case improved as rapidly as one could wish after the teeth were removed, yet in many instances the improvement was so marked as to leave no doubt of the connection between the oral sepsis and the irido-cyclitis."

Anyone doubting the importance of this connection should read Goulden's reports of cases.

According to Fuchs, sympathetic ophthalmia is a peculiar form of irido-cyclitis, with such distinctive microscopical appearances that it is possible to select from among a cabinet of slides from excised eyes those which have been excised on account of having already given rise to sympathetic disease. (*See Medical Annual*, 1907, p. 342.)

Hitherto it has been considered axiomatic that sympathetic irido-cyclitis can only follow a *perforating* traumatism of the exciting eye. Harrison Butler,[2] however, throws some doubt on this as a universal rule. Fuchs' type of inflammation has, it seems, been seen associated with intra-ocular sarcoma, and five of these cases have been recorded in which an inflammation, which must be regarded as sympathetic,

followed in the fellow eye. This seems to open the way to admit the possibility of sympathetic disease from endogenous infection resulting from an injury not involving a perforating wound of the exciting eye. Supposing it to be due, as it probably is, to micro-organisms which find a peculiarly favourable nidus in the ciliary body, it is arguable that the ciliary body is not the only possible medium in which they may be cultivated. The weight of present authority is distinctly against the possibility of the occurrence of sympathetic irido-cyclitis without the presence of a perforating wound in the exciting eye. Nevertheless, instances are from time to time related, as in the present paper, where there seems at any rate the possibility that the opposite has been the case. The practical importance of this subject lies in the question, "Are we justified in retaining an eye which has become blind from a plastic uveitis following a non-perforating injury, and which may be chronically injected, tender, and soft, or may be in a condition of complete phthisis bulbi?" The answer must be in the negative.

REFERENCES.—[1]*Ophthalmoscope*, 1911, 178; [2]*Ibid.* 558.

CLAVICLE, SARCOMA OF. *Priestley Leech, M.D., F.R.C.S.*

W. B. Coley[1] records some unpublished cases of this disease. It is not very common, and the diagnosis has to be made from tuberculosis, syphilis, myositis ossificans, and in the early stages from callus after injury. A distinct history of antecedent trauma was noted in 7 out of 9 cases observed by Coley. The *x*-ray examination is of very great aid in diagnosis, especially in tumours of central origin. Total or partial excision of the bone should be done as soon as the diagnosis is made; the mortality under modern aseptic conditions should be very small, and the danger of early local or general metastasis is very great. Coley thinks that the use of the **Mixed Toxins** of erysipelas and *B. prodigiosus* immediately after operation, as a prophylactic against recurrence, is strongly indicated as a routine measure.

REFERENCE.—[1]*Ann. Surg.* 1910, Dec.

CLIMACTERIC.

Ovarian Extract for the relief of troublesome symptoms (*page* 29).

COCAINISM. (*See* NARCOMANIA.)

COLLATERAL CIRCULATION. *Priestley Leech, M.D., F.R.C.S.*

The possibility of testing the efficiency of the collateral circulation is very desirable in many surgical conditions. If the surgeon could know beforehand the limits of the collateral circulation, he could modify his procedures accordingly. Matas[1] says this need is greatest in the treatment of peripheral aneurysms which involve the large arterial trunks of the limbs or the neck. Hitherto little attention has been directed towards determining the adequacy or inadequacy of the collateral circulation. He tried Korotkow's method of determining the efficiency of the collateral circulation in the limbs, in which the

peripheral blood-pressure at the very tips of the extremities is determined. "If the peripheral blood-pressure as shown by the manometer (a modified Gaertner's tonometer) is more or less sustained after the compression of the main trunk immediately above the aneurysm, then the main trunk may be safely obliterated in the aneurysmal sac. If, on the other hand, the blood-pressure falls to zero, it is evident that the collateral circulation is inadequate, and that no chance should be taken with the obliterative operation, or with any procedure whatever (ligation, extirpation, etc.) which would permanently occlude the parent artery."

Matas found that the method was of comparatively little value in the lower extremities, where it is most needed, as the rubber rings which are supplied with the Gaertner tonometer are satisfactory enough with the fingers, but not with the toes. After some experiments Matas came to the conclusion that a modification of the proposition made by Moszkowicz,[2] of Vienna, in 1907, known as the hyperæmia test, was the most practical basis for a test of the collateral circulation. The Moszkowicz test for determining the area of the viable or living parts as distinguished from the dead, dying, or ischæmic tissues (in cases of senile arteriosclerotic or thrombotic gangrene, is employed as follows: An Esmarch bandage is tightly applied from the tips of the toes, or fingers, by overlapping in the usual way, as a special bandage, to the root of the extremity. In threatened gangrene of the toes and foot, the band is carried to the groin, where the constrictor or rubber tourniquet is applied. The bandage is allowed to remain from five to ten minutes. The constrictor is then released, and the downward progress of the reactionary pink wave of hyperæmia is observed as it travels to the periphery. The red blush travels much more slowly as the obstructed territory is approached; it becomes less active, and stationary as the total ischæmic areas of the foot or leg are entered. The red colour spreads down hesitatingly, almost imperceptibly, especially at the toes. Individual anæmic patches which are not yet necrotic, but which are permanently deprived of blood or circulation, remain white, and the contrast between the red and the pale districts becomes more marked with the extent of the arterial obstruction. Any operation within the pale or cadaveric zone will end in sloughing of the flap. The proper place to amputate will then be well inside of the red or hyperæmic zone. Moszkowicz satisfied himself from laboratory experiments that the level of the "hyperæmic" blush would approximately correspond to the level of the obstruction in the main artery. The vast majority of the cases thus far reported in which this test has been applied, are cases of gangrene of the leg associated with partial or complete obliteration of the popliteal artery. The rapidity with which the blush spreads from the base to the periphery is not constant in all cases. Once the hyperæmic wave has spread over the limb, it becomes intensified for a variable period of a quarter of a minute to one or even two minutes, then the redness becomes stationary for a few seconds, and gradually pales to the normal living

colour in the course of five to ten minutes or even longer. This test was originally used as a guide to the line of amputation in dry senile or pre-senile gangrene of the lower extremity. Matas concludes from his observations, that the appearance of a hyperæmic wave after constriction of a limb is indicative of a free supply of blood in the hyperæmic area. In healthy normal limbs the occlusion of the main artery of a limb does not necessarily suppress the hyperæmic wave

Fig. 55.—The Massachusetts Hospital. Compressor applied to the femoral at Hunter's canal.

in the distal parts below the obstruction, as long as the collaterals are pervious, and sufficient to carry the blood beyond the level of the obstruction in the main artery. The distinctness of the blush varies considerably, according to the condition of the collateral circulation after constriction. The intensity of the blush would seem to be directly proportional to the activity of the collateral circulation. It is also true that as long as there is a reactionary blush, or a restoration

Fig. 56. The Compressor applied to the upper brachial artery.

of the *living* colour, no matter how faint it may be, or wherever it may be, there it may be said the tissues are alive; while the indefinite persistence of a cadaveric pallor is ominous of a suppressed or impeded circulation. The failure of the hyperæmic blush does not necessarily indicate that there is no circulation in the parts beyond the arterial circulation; so long as there is some pink or living colour—colour that can be made paler by pressure—there is

some circulation. An absolute waxy pallor means complete ischæmia, and ultimate death of the colourless parts if it persists. Matas says his clinical observations have convinced him that so long as there is a free and efficient collateral circulation, the hyperæmic wave, in an intense or a modified form, will appear after the removal of the constrictor, and will spread over the limb to every part of the periphery. It may not be as bright and brilliant as in a normal limb, but a living and gradually increasing flesh colour will appear in spite of the occlusion of the main artery. The test is applied as follows in the case of a popliteal aneurysm: The patient is placed on his back, with the lower limb exposed on a white cloth or sheet, which will show the contrast of the colour of the skin to the best advantage. A good daylight is necessary. Determine the line of the femoral artery in Hunter's canal, and adjust the block of the compressor (*Fig.* 55) over this line at a point nearest the aneurysm without encroaching upon the sac. Tighten the compressor on the artery until all pulsations and sounds cease in the aneurysm, and the volume of the swelling is reduced. If at this stage there is a peripheral pulse in the dorsalis pedis and posterior tibial arteries, the pressure should be continued until these cease absolutely. After keeping the tourniquet on for some time while the aneurysm is absolutely still and collapsed, some change may be noted in the colour, temperature, and sensibility of the skin below the knee. The variations in colour noticed after simple compression of the main trunk above the aneurysm are not always marked enough to allow the observer to arrive at definite conclusions, especially as the bulk of the blood originally in the limb before the experiment began has not been displaced by forcible exsanguination with elastic pressure. The pressure is temporarily relaxed, and a broad Esmarch elastic bandage is snugly adjusted from the tip of the toes, compressing these more evenly over several layers of gauze and continuing the roller until the upper level or pole of the aneurysmal swelling is reached. At this level the bandage is firmly held in position with a clamp, and fixed, while the operator readjusts the compressor until all pulsation in the sac is absolutely arrested and the aneurysm is *stilled*. With the finger of the operator constantly on the aneurysm to make sure its pulsation is absolutely controlled, the elastic bandage is held in place for five minutes in old subjects, or eight in the younger patients, especially in dealing with traumatic cases. The elastic bandage is now quickly removed, while the compressor still secures the main artery. Close attention must then be given to the returning hyperæmic wave, and the progress of the blush is noted as it descends, rapidly at first, in the zone immediately below the level of compression.

Matas gives notes of eleven observations on healthy people made in this manner. It is proved that in spite of absolute pulselessness, a normal pinkish colour is all that is necessary to indicate that the limb is alive and not likely to perish from ischæmia. In aneurysms, especially popliteal aneurysms, in which the ankle pulses have been

obliterated spontaneously by probable embolic or thrombotic obstruction of the tibials (a not infrequent occurrence in practice), gangrene of the foot ensues if the collaterals are not sufficiently developed. The survival of the limb after such an accident, and the preservation of a normal colour and sensation in the peripheral parts in spite of the loss of the ankle pulses, clearly prove that a compensatory circulation has been established, and that no fear of gangrene, after obliteration of the main artery or of the aneurysm itself, need be entertained. A sitting of one hour under the compressor without changing the cadaveric hue would suffice to put the operator on his guard and justify the postponement of the operation. It is doubtful if a patient could bear the pressure of the compressor for longer than an hour. There is some risk of clotting taking place in the sac after this procedure, but Matas thinks this is negligible in view of the advantages to be derived from it.

As regards the importance of testing the collateral circulation in dealing with operations on the neck, including all neoplasms which in the course of their extirpation or surgical treatment might require the obliteration of one or both carotid tracts (common and internal carotids especially), a long experience has convinced Matas that the dangers of intracranial complications are not to be underestimated.

Instead of Halsted's bands, he has used a simple self-retaining aluminium band, which occludes the artery by merely flattening it, without constricting its walls. It can be pressed and kept in place by the fingers, and can be removed at any time if required.

Experiments were made by him and his assistant, Dr. Carrol W. Allen,[3] with aluminium bands which retain their hold on the artery without metal clips. The conclusions they arrived at are: (*a*) It is possible to compress a vessel to the point of obliterating the pulse, and maintain this pressure for three or four days, before adhesive or obliterative changes in the intima occur. (*b*) All the vessels clamped in this manner stood compression 72 hours without microscopic change in the intima; some few began to show marked changes in 96 hours. (*c*) There is apparently no reason why in occluding the great vessels at the root of the neck, chest, and lower abdomen in continuity, these removable bands should not be substituted for the circular ligature, which permanently damages the artery even when carefully applied. Furthermore, the ligature does not permit of the release of the constriction after a few hours or days of observation without certainty of thrombus formation at the seat of the ligation. (*d*) They suggest that the simple method of occlusion should be used as a preliminary test of the efficiency of the collateral circulation in all regions in which the hyperæmia test as previously described is not applicable.

References.—[1]*Ann. Surg.* 1911, Jan.; [2]*Mittl. aus. d. Grenzgeb. d. Med. u. Chir.* 1907, Band xvii, Heft. 1 & 2; [3]*Jour. Amer. Med. Assoc.*, 1911, Jan. 28.

COLOUR BLINDNESS. *A. Hugh Thompson, M.D.*

This subject is of such great practical importance in connection with shipping and railway-signalling, that it is surprising that the Holmgren test, which has been proved to be defective, should still be the one officially recognized by the Board of Trade.

In his Hunterian Lectures, Edridge-Green says that defects of colour vision are of three different kinds. The first depends upon an imperfect evolution of the colour sense. In normal individuals the cerebral or retino-cerebral apparatus, which has to do with the perception of colour, is so far evolved that differentiation between five, six, or even, in exceptionally endowed individuals, seven colours of the spectrum is possible. In a more primitive evolutionary stage, and in individuals with a congenital defect of colour vision, only four, three, or even two colours may be distinguished ; in the totally colour-blind, not even two. Objectively, the differences of colour are infinite, depending on the variations in wave length between the shortest and longest waves which constitute the spectrum. Subjectively, the differences depend upon the capacity of the individual to appreciate these variations, and the first to be appreciated are naturally those between which the difference in wave length is greatest, i.e. violet and red at the two opposite ends of the spectrum. Thus there are various degrees of colour blindness, viz., dichromics, who see only two colours, trichromics, who see three, and similarly those who see four or five, six being the number of colours usually distinguishable by the average individual. It is only di- and trichromics who are liable to confuse red and green, and consequently only those whom it is desirable to exclude in a Board of Trade test.

The second kind of colour blindness depends upon a shortening of one end of the spectrum, so that, e.g., either spectral red or violet appears black. It is obviously necessary that individuals who show the former defect should be excluded by an efficient test, while those who see a spectrum shortened only at the blue end might be allowed to pass.

The third sort of defect depends on the existence of a central scotoma for colour, so that while large coloured objects, or small ones held sufficiently close, are correctly recognized, small coloured objects, or larger ones seen at a distance, cannot be seen as they appear to the normal sighted. This sort of defect is always acquired, and not congenital, and is especially associated with tobacco amblyopia.

Now, according to Edridge-Green, none of the tests for colour blindness which have, until recently, been in common use, are efficient for the purpose of eliminating those liable to confuse red and green lights. He himself has invented various tests, the most important being a lantern test, by which the successive colours of the spectrum can be exhibited, and modified by various shades of neutral tint, with different-sized apertures to test for central scotoma. For the procedure to be adopted the original paper must be consulted ; but it may here be said that, contrary to what used to be taught, the importance is dwelt

on of making the candidate *name* the colours. He must be rejected: (1) If he call the red green, or the green red, in any circumstances; (2) If he call the white light, in any circumstances, red or green, or vice versa; (3) If he call the red, green, or white lights black in any circumstances. "No amount of coaching," he says, "will enable a colour-blind person to pass this test, while almost any other may be passed in this way." For the convenience of those who are only occasionally called upon to test for colour blindness, he has devised a pocket test, which contains threads of wool and silk of the required colours, arranged on a series of nineteen cards, the method of examination being detailed in the lecture.

Reference.—[1]*Lancet*, 1911, i, 285, 358.

CONJUNCTIVA. *A. Hugh Thompson, M.D.*

In an interesting lecture, Mayou[1] remarks that many of the common micro-organisms are so frequently found in the healthy conjunctival sac that they may almost be regarded as normal inhabitants of it. The commonest are *Staphylococcus albus* and *B. xerosis*, which occur in about 80 to 90 per cent of cases. Less common are the *Morax-Axenfeld bacillus* and the *pneumococcus*, which occur in about 8 per cent. Organisms occasionally found are the *Staphylococcus aureus*, *B. subtilis*, and *streptococcus*. How is it that, this being the case, conjunctival infection so rarely takes place? The answer, according to Mayou, is fourfold: (1) The lacrymal secretion, although having little or no bactericidal action, keeps the eye cleansed by mechanically washing away the organisms. (2) The epithelium affords an important barrier to infection, for it has been proved experimentally that such organisms as the tubercle bacillus, staphylococcus, and pneumococcus cannot attack the conjunctiva without a break in the epithelium. (3) The laxity of the tissue, together with a large blood-supply, allows the conjunctiva to be filled with tissue fluids containing protective bodies. (4) The phagocytosis of the cells forming the lymphoid layer in the conjunctiva offers an additional barrier to infection.

The bearing of this on infection after intra-ocular operations is evident. In operating upon the eye, it is practically never possible to obtain a scientifically absolute asepsis. The probability of infection, however, depends partly on the number of organisms present in the conjunctival sac, and partly on their nature. Constant washing out is the only means of reducing the number of organisms to the minimum, and though antiseptics of sufficient strength to kill the organisms directly cannot be used, they may yet prevent their multiplication. Mayou has proved that cultivations taken from the conjunctival sac almost invariably remain sterile after about three days of washing out with 1–6000 perchloride of mercury, or even boric acid, used four times daily. This procedure, he thinks, should therefore be adopted as a matter of routine before any intra-ocular operation. After operation, frequent bathing with mild antiseptics is equally important.

Mayou has found *Staphylococcus albus* (by far the commonest organism, but considered by Axenfeld to be innocuous) in pure cultivation in four out of six cases of panophthalmitis following operation, and four out of seven cases of post-operative irido-cyclitis. In three of the latter **Vaccinated** with the organism in the early stage of the infection, it cleared up rapidly. The *pneumococcus*, though rare in the normal conjunctival sac, is a comparatively common cause of suppuration after operation, and is usually associated with lacrymal obstruction. The *streptococcus* always causes very acute suppurative inflammation, but its occurrence is rare. Whether the *B. xerosis* ever causes infection must be considered doubtful.

Reference.—[1]*Ophthalmoscope*, 1910, 554.

CONSTIPATION. *Robert Hutchison, M.D., F.R.C.P.*

Etiology.—Kohn[1] suggests the following classification:—

A. Organic or Mechanical Causes.—(1) Chronic sigmoiditis or proctitis. (2) Obstruction of bowel by stricture, neoplasm, adhesions, volvulus, etc. (3) Foreign bodies, hepatic or intestinal calculi. (4) Malformations of colon, sigmoid, or rectum. (5) Enteroptosis. (6) Fæcal impaction.

B. Functional Causes.—(1) Atony of colon: (*a*) Sedentary habits; (*b*) irregularity of stool; (*c*) advanced age; (*d*) relaxation of abdominal muscles. (2) Impairment of secretions. (3) Intestinal spasm. (4) Increased digestion and absorption of food: (*a*) Improper diet; (*b*) hyperacidity of gastric juice. (5) Drug and enema habit. (6) Psychic influences: (*a*) Fear of pain in local inflammations; (*b*) cerebral excitement or preoccupation.

He does not consider that atony of the bowel is nearly as common a cause of constipation as is supposed, nor does he think that spasm plays much part either. The most important and most frequent factor in the etiology of chronic constipation, he says, is to be found in the character of our diet. Schmidt and Strasburger have found that in the so-called atonic forms of constipation the bulk of fæces in proportion to the amount of food ingested is considerably diminished. The bacterial content of these fæces also is comparatively small. There are several dietetic factors at work in producing this result. First, we eat more animal and less vegetable food than did our forefathers, and we know that the products of vegetable fermentation excite peristaltic movements more strongly than do those of animal decomposition. Secondly, the modern methods of refining food and of preparing it to increase its digestibility, added to our more savoury ways of cooking it, which stimulate the secretion of the digestive juices, all tend toward producing a more complete absorption, leaving little residue to act as a stimulus for the lower bowel.

Treatment.—It follows from the foregoing that **Regulation of the Diet** is the most important means of cure. He therefore advises patients to eat abundantly of those foodstuffs containing the most cellulose, which is affected very slightly by the digestive juices. Such

foods are the green vegetables—spinach, tomatoes, the cabbages, celery, onions, the tubers, etc. ; and the various fruits with their skins —apples, pears, peaches, plums, berries, etc. Patients should also be instructed to drink an abundance of water, at least six to eight glasses a day, and to attempt the establishment of a regular time for the daily evacuation of the bowels. If dietetic means fail, the best laxative to use is **Fluid Cascara.** If there be gastric hyperacidity, **Magnesia** may be employed. The writer finds "physical" methods of treatment (massage, exercises, electricity, etc.) disappointing—probably because their use is founded on the atonic theory of constipation, which is only true of a minority of cases.

Luke,[2] on the other hand, praises electricity in the form of the **Sinusoidal Current** in cases of long-standing constipation in otherwise healthy patients, and describes examples of its successful use and the technique of its employment. Cyriax[3] believes strongly in the value of **Mechanotherapy** in the form of (1) Active exercises ; (2) Respiratory exercises ; (3) Passive manipulations of the abdominal viscera ; (4) Passive stimulation of the abdominal sympathetic. He describes in detail some of these procedures.

Kauert[4] reports upon sixteen cases treated with **Hormonal,** a substance which, it will be remembered, is obtained from the spleen and has a specific power of stimulating intestinal peristalsis. He found that it had a marked effect in five out of nine cases of chronic constipation, but in only two was this lasting. It is specially useful in cases of "paralytic ileus." He found no bad consequences from its use.

References.—[1]*Ther. Gaz.* 1910, Oct. 15 ; [2]*Glas. Med. Jour.* 1911, June ; [3]*Brit. Med. Jour.* 1911, Mar. 18 ; [4]*Münch. med. Woch.* 1911, Ap. 25.

CORNEA. *A. Hugh Thompson, M.D.*

Keratomalacia.—This is a disease of the cornea due to malnutrition, and affects almost exclusively infants under a year old who are improperly fed. Both corneæ become gradually opaque and slough, and the patient usually dies. In some parts of the world it is said to be not uncommon. In London, according to Stephenson, its incidence is greatest in the months of June, July, August, and September, i.e., when the infantile mortality from infantile diarrhœa is greatest. This is probably the chief causative factor, though some cases are connected with syphilis, tuberculosis, or simple marasmus. Clinically, the babies suffering from this disease are always wasted and extremely ill. There are no signs of external inflammation about the eyes, but when the lids are separated, a process which the child is too feeble to resent, the corneæ are seen to be involved. If the case is seen early, the process may not have gone beyond ulceration of one or both corneæ. Later the corneæ appear ashy white, being nothing but slough. Stephenson compares the condition to bedsores, with which it is really analogous. There is no conjunctival chemosis, but an extreme dryness, with, in many cases, the greasy-looking white patches known as "xerosis," a condition associated with a well-known bacillus

and due also to dried-up secretion from the Meibomian glands. The cases occur after the age of ophthalmia neonatorum and before that of phlyctenular disease. Stephenson remarks that ulcers of the cornea, especially if bilateral, in infants between the ages of two and twelve months, are far more likely to be due to keratomalacia than to any other cause.

TREATMENT.—The chance in these cases depends almost entirely on the possibility of improving the general nutrition. Locally, beyond the employment of warm, mild **Antiseptic Douches,** the only drug worth mentioning is **Eserine,** half to one per cent, dissolved in sterile oil and dropped into the eyes twice to six times a day.

REFERENCE.—[1]*Brit. Jour. Child. Dis.* 1911, 337.

CORYZA.

Urotropin (*page* 18). **Sodium Salicylate** (*page* 37).

CYCLIC VOMITING. (*See* VOMITING.)

DELIRIUM TREMENS. *Purves Stewart, M.D., F.R.C.P.*

Delirium tremens is a complication of chronic inebriety. It frequently follows a sudden withdrawal or diminution in the amount of alcohol to which the patient has become accustomed, as, for example, in chronic alcoholics who, from accident, acute illness, confinement to prison, etc., are suddenly deprived of their habitual large doses.

We can recognize two well-defined stages in the development of delirium tremens. There is an *incipient stage*, characterized by sleeplessness, restlessness, tremors, and occasionally hallucinations, which at first are recognized as such by the patient. The later, *fully-developed stage* has delirium superadded, and the visual hallucinations are now no longer recognized as phantasms, but cause the patient acute excitement and distress. The patient is noisy and garrulous, often violent, with a temperature of 100° to 102°, even in cases without pulmonary complications; he perspires profusely, and there is a slight leucocytosis, amounting to from 7000 to 9000 per cubic millimetre. Some physicians only recognize this second stage as constituting delirium tremens, but it is best to include the early stage of tremors and hallucinations without delirium as within the category.

TREATMENT.—Ranson and Scott,[1] recognizing the two stages of the disease, have recorded the results in 1106 cases treated in hospitals at Chicago and Massachusetts. Their report contains some interesting statements, sometimes at variance with the views of most European physicians. It is possible, as they admit, that the relatively high mortality (22 per cent) in their series may point to a more severe type of delirium tremens as occurring in American patients. In the incipient stage of the disease, Ranson and Scott state that the patients were usually allowed to walk about the ward, unless confined to bed by some other malady. They were only put to bed when they became delirious, and were retained there by mechanical means. (Most European physicians prefer to keep the patient in bed from the outset.

as soon as the diagnosis is reasonably established.) An **Aperient** mixture was given at the start, and the **Diet** was mainly a fluid one. An initial **Hot Bath,** or a **Cold Pack,** measures which we in England have found of great benefit from their sedative effects, are seldom given by these American observers.

The first and most urgent indication in delirium tremens is to produce sleep. A good mixture for this purpose is as follows :—

℞	Potass. Bromid.	gr. xxx	Tinct. Hyoscyami	℥xxx
	Chloral Hydrat.	gr. xx	Aq. ad	℥j

This mixture is often more efficacious if administered in a small glass of stout. In cases with maniacal motor excitement it is advisable to give **Hyoscine Hydrobromide,** gr. $\frac{1}{100}$, hypodermically ; this usually calms the patient. Ranson and Scott consider that **Chloral** has its best effects in the early stage of the disease, before delirium is established. Of the other hypnotic drugs, they tried **Paraldehyde** in a few cases, and found its action similar to that of chloral and bromide. They strongly condemn the use of opium or morphine, and found that the mortality in that particular series was higher than with other drugs. They also express themselves strongly against the employment of hyoscine. From their experience of various drugs, the one which they praise most highly is **Veronal,** which appeared to produce its sedative effect without any disturbance of the heart or circulation. As to the question of **Alcohol,** they quote figures to prove that when a patient is in the incipient stage of delirium tremens, the withdrawal of alcohol greatly increases the chances of his passing into the delirious stage. [My view is that when the delirious stage is established, alcohol is better avoided. If heart failure is threatened, some non-alcoholic stimulant should be given, such as **Sp. Ammon. Aromat.** ℥j by the mouth, or **Digitalin** gr. $\frac{1}{100}$ hypodermically.—P. S.] Throughout the course of the disease the chest should be carefully examined every day, to watch for the appearance of pneumonia or other chest complications.

Reference.—[1] *Amer. Jour. Med. Sci.* 1911, i., 673.

DERMATITIS HERPETIFORMIS. *E. Graham Little, M.D., F.R.C.P.*

British experience would certainly regard dermatitis herpetiformis as rare in *childhood*. Knowles was able to collect fifty-seven cases in the literature, of which less than twenty were in children under the age of four. Sutton[1] records a new case which began in a baby aged nine months and had lasted two and a half years when seen by him. Pigmentation and scars had been left by previous lesions, which were usually papulo-vesicular, without any special grouping. The urine was of sp. gr. 1026, and contained indican but no hæmatoporphyrin; there was eosinophilia at the height of the attack (11·5 per cent). The most satisfactory treatment was found to be administration of **Thyroid Extract** (gr. $\frac{1}{6}$, the child being aged three at the time), and locally a lotion containing 5 per cent of **Tinct. Picis Mineralis Co.** with **Calamine** and **Oxide of Zinc.**

Reference.—[1] *Amer. Jour. Med. Sci.* 1910, ii, 727.

DERMATITIS REPENS; ACRODERMATITIS PERSTANS.

E. Graham Little, M.D., F.R.C.P.

Sutton[1] concludes from histological data that these two rare and obscure diseases are identical. He was able to get sections from three cases of the former and one of the latter disease. Extremely chronic pus infection is common to both forms, and probably some particular strain of staphylococcus is responsible for their production. The hands and feet are attacked more often than other parts, probably because exposed to injuries and infection. The most efficient treatment was found to be the administration of stock **Staphylococcus Vaccine** (a mixture of *aureus, albus,* and *citreus*), and locally, soaking with a solution of **Salicylic Acid** 1, **Tannic Acid** 5, **Alcohol** 50. *x*-rays did not appear to have any beneficial effect.

REFERENCE.—[1] *Jour. Cutan. Dis.* 1911, 325.

DESMOID TUMOURS. (*See* ABDOMINAL WALL.)

DIABETES INSIPIDUS.

Pantopon found useful in (*page* 32).

DIABETES MELLITUS. *Francis D. Boyd, M.D.*

PATHOGENESIS.—Those interested in the *chemical* problems of diabetes mellitus should consult the Cartwright Lectures of the Alumni Association of the College of Physicians and Surgeons, Columbia University, New York, by Professor Adolf Magnus Levy,[1] who gives a very able and exhaustive account of our present knowledge. He considers the conception of diabetes as a concrete unity is justifiable, inasmuch as the metabolic disturbance itself, and its intensity, dominate the pathological process. He regards a primary disturbance of the sugar-splitting as the essential and primary process in severe cases. The complete working out of the view, according to which diabetes is based *only* on an increased formation and mobilization of sugar, would lead to the conclusion that the molecule of protein and of fat also, in normal life, was transformed into sugar. This view has no justification. Possibly increased mobilization co-operates in diabetes. There is also, in a certain sense, an increased formation of new sugar; but this increase in sugar formation and mobilization is only the consequence of disturbed combustion; it is but a secondary result. In spite of the fact that sugar is wasted in the body, those organs which need sugar do not cease in their demands for it. The liver and other producers of new sugar strive to meet these requirements; they form new sugar and send it to the other organs, but without any advantage to the organism. This disturbance in the using up of sugar will in cases of severe diabetes increase in the course of time; yet it never need be absolute; some of the newly-formed sugar will always be catabolized. According to this conception the muscles, as the principal organ implicated in the combustion of sugar, would come more into the foreground of the disease. The mobilizing organs, such as the suprarenal capsule and the thyroid gland, take a secondary place. It must not be said, however, that a

primary muscle diabetes exists in which the muscle system is involved exclusively. Even if attempts to isolate the pancreas hormone, and to prove the co-operation of the pancreas and muscles, have not yet succeeded, still the solution of the problem lies in this direction.

Lusk[2] urges that the *intensity of diabetes* should not be determined by the percentage of sugar in the urine, but by the relationship between the intake of sugar plus the possible maximum of sugar production from protein as compared with the total output of sugar: 6·25 grams protein are equivalent to 3·65 grams dextrose and to 1 gram of nitrogen. A formula can therefore be constructed which gives the co-efficient of excretion:

$$\frac{\text{output of dextrose}}{\text{urine N.} \times 3{\cdot}65 + \text{food dextrose.}}$$

This multiplied by 100 gives the "co-efficient of excretion" of Falta, or the percentage of sugar excreted.

Pratt[3] discusses the *relation of the pancreas* to diabetes, and finds that despite opposing theories and conflicting observations some facts have been definitely ascertained. The total removal of the pancreas always leads to fatal diabetes. Atrophy of the pancreas produced by excluding all the pancreatic juice from the intestine is associated with a marked decrease in the limit of assimilation of sugar. Transplantation of a portion of the pancreas prevents the development of diabetes when the rest of the gland is extirpated. Lesions of the islands of Langerhans are found in most cases of diabetes, and are usually associated with changes in the acini. The conclusion is arrived at that the pancreas has an internal function concerned with the metabolism of sugar.

Magnus Levy,[4] discussing the question of *acidosis*, points out that it is unnecessary to restrict the amount of fat taken by the diabetic, for increased fat in the diet does not raise acidosis. Increased ingestion does not necessarily mean increased decomposition of fat. A surplus of fat in the diet does not raise oxidation any more than does a surplus of oxygen in the respired air. There is no danger that, by giving more fat, more fat will be decomposed and more acetone bodies set free. Acidosis does not only, or perhaps at all, depend upon the formation of acids, but also, and perhaps exclusively, upon their combustion. In almost no case of diabetes has the ingestion of fat caused an increased output of acetone. (Butter is excepted on account of its richness in glyceryls of butyric acid.) A high intake of protein may at times increase acidosis, not from the direct formation of oxybutyric acid from protein, but because the high protein content of the diet makes an extra call on the oxidizing powers of the organism and diverts these from the combustion of acetone bodies. Alcohol is the only food-stuff which acts beneficially in diabetic acidosis, by decreasing materially the amount of acetone bodies in the urine. Bicarbonate of soda, which is continually employed in severe acidosis, does not act directly against it; neither does it diminish the formation

of acetone bodies or favour their combustion. In many cases, on the contrary, the amount of acetone bodies in the urine will increase if great quantities of alkali are given. This is not a disadvantageous sign, but indicates increased *excretion* of acetone bodies. However beneficial the action of alkalies, they are only palliative, and we must continue the search for a direct remedy.

Treatment.—Considerable attention has been directed in France and in America to the value of the **Soy Bean** as a foodstuff. The soy bean (*Glycine hispida*) is an annual leguminous plant growing wild in Cochin China. It has been extensively used as a food in China and Japan, and of late in India, Europe, and America. The bean contains much protein and fat, but little starch. It is difficult to make a bread of it without adding a certain amount of some other flour ; but Lecerf claims to have made such a bread, resembling gingerbread, which is not disagreeable, and contains little or no starch. The beans may be used as a vegetable by soaking them for about twelve to sixteen hours, until the skins come off ; stirring until the skins, rising to the surface, can be removed ; and then boiling in salt water, or with bacon, until soft, and seasoning with pepper, salt, and butter. The soy gruel flour yields about 13 grams of protein and 120 calories to the ounce. Friedenwald and Ruhrah[5] give directions for its use as a gruel, in broths, and in making biscuits. They find that the bean is a valuable addition to the diet of the diabetic. In some way the soy bean causes a reduction in the excretion of sugar in diabetic subjects on the usual dietetic restrictions.

When von Noorden first described the **Oatmeal** treatment of diabetes, it was limited to the most serious cases with acidosis ; now it receives a much wider application. In favourable cases this treatment reduces the sugar excretion by more than a strict diet alone, and a second or third application of the "cure" may even bring it to zero. This result is not, however, very frequent. In cases of serious acidosis the sugar excretion may rise under the oatmeal treatment ; e.g., if on a strict diet it had been 20 to 30 grams, it may rise to 40 to 60 grams. But the patient is taking 170 grams starch, equivalent to 190 grams sugar, and is therefore the gainer by at least 100 grams of carbohydrate. Sugar excretion may be lowered after the second or third exhibition, and tolerance for carbohydrates is improved. In cases which do not improve, or do so very slowly, under ordinary stringent diet, sugar may rise as high as 100 grams or more under the oatmeal cure. At first von Noorden excluded cases of severe diabetes with acidity from the cure, but now Lamperé and Falta, von Noorden's pupils, apply it to such cases, and in this view Magnus-Levy[6] concurs. In mild cases, where on 60 to 80 grams of carbohydrate very little sugar is excreted, the oatmeal cure is unnecessary, but such cases will benefit by a vegetable day, and one can interpolate an oatmeal day with advantage. In severe cases the oatmeal cure should not be carried out during periods of irregular life, nor without preparation by several days of strict diet in which 50 grams of bread is the maximum.

Following on the strict diet a vegetable day may be given. Preparation reduces the quantity of sugar in the urine and blood, and paves the way for two to four oatmeal days. The oatmeal days are followed by a vegetable day, and then a few days of strict diet, which the patient can the better tolerate as he is satiated with carbohydrate. The oatmeal diet for a day consists of eleven ounces of dry oatmeal and five ounces of butter. The oatmeal is put into three parts of water slightly salted, and thoroughly cooked for at least six hours. While still hot it is strained through a sieve. The coarse covering of the kernel remains on the sieve. The butter is stirred in while the porridge is still hot. This one day's food is taken in portions at short intervals during the twenty-four hours. No other food is permitted except a little black coffee and brandy. Under careful supervision the oatmeal cure has given remarkable results ; the difficulty for the practitioner is that the case requires constant watching and daily estimations of sugar.

Little progress seems to have been made in the *specific therapy* of diabetes. **Atropine** was credited by Rudisch with a definite effect in checking or preventing glycosuria when combined with careful diet, but further experience does not seem to justify the claim, and in a series of experiments carried out on depancreatized dogs, atropine was found to have no influence on the sugar excretion. **Santonin,** again, has been used, but an exhaustive trial at the hands of Walter Löfer[7] proved that it had little or no effect on sugar excretion in the cases investigated. Crofton[8] records his continued experience of extract of pancreas in the treatment of diabetes. He has made use of an extract from which all the proteins and external ferments had been removed, and is now commercially obtainable under the name of **"Hormonadin."** Crofton states that he has not yet had enough experience to enable him to dogmatize, but he has seen a sufficient number of cases, going to the bad on the usual treatment, improve and resume ordinary life on an ordinary full diet. It is not claimed that it is possible to cure most cases of diabetes, but that the treatment prevents the disease getting worse. It seems that the cases which can recover completely are those acute ones in young people whose glycolytic mechanism can be restored if tided over the acute phase, just as acute nephritis can be completely recovered from. A case of treatment, apparently successful for a time, by feeding with **Calves' Pancreas,** is recorded by Cowles.[9] In sharp contradiction of these clinical cases, Leschke[10] finds that the evidence proves that fresh pancreas extract in diabetic animals and man causes an increased excretion of sugar, while in normal animals it has a glycosuric, a toxic, and even lethal effect. The pancreas therapy of diabetes is therefore on experimental evidence contraindicated.

Thompson and Wallace[11] contribute a preliminary communication on the influence of **Creatin** and **Creatinin** in metabolism, bearing on the dietetic treatment of diabetes. They found that the addition of small quantities of creatinin to the diet temporarily increased the out-

put of sugar by nearly 50 per cent. From this the practical point arises that soups, meat, and meat extracts liable to contain creatinin, should not be given with the diet.

Opium to prevent coma (*page* 28).

Sodium Bicarbonate may cause œdema (*page* 9).

References.—[1]*Med. Rec.* 1910, ii, 889, 944, 991; [2]*Jour. Amer. Med. Assoc.* 1910, ii, 2105; [3]*Ibid.* 2113; [4]*Johns Hop. Hosp. Bull.* 1911, 46; [5]*Amer. Jour. Med. Sci.* 1910, ii, 793; [6]*Berl. klin. Woch.* 1911, 1213; [7]*Berl. klin. Woch.* 1911, 421; [8]*Dubl. Med. Jour.* 1911, 421; [9]*Bost. Med. and Surg. Jour.* 1911, i, 921; [10]*Münch. med. Woch.* 1911, 1396; [11]*Brit. Med. Jour.* 1911, ii, 1065.

DIARRHŒA.

Glutannin (*page* 16). **Ascitic Fluid** (*page* 6). **Uzara** (*page* 61).

DIARRHŒA, INFANTILE.

G. F. Still, M.D., F.R.C.P.

Etiology.—Diarrhœa in infants is, as Tibbles[1] points out, very rare—at any rate in its more serious forms—in breast-fed children. He classifies the causes thus:—*Autogenetic*: (1) Gastro-enteric catarrh: (*a*) acute, (*b*) chronic; (2) Intestinal fermentation; (3) Toxæmia. *Heterogenetic*: (4) Mechanical irritation; (5) Nervous influences; (6) Drugs; (7) Improper feeding; (8) Bacterial infection. The ordinary summer diarrhœa is evidently not due merely to hot weather, there is also bacterial irritation by streptococci, staphylococci, *B coli*, *B. proteus*, *B. shiga*, and *B. cyanogenus*.

Young[2] finds that nearly half the cases (41·5 per cent) are between six and twelve months old. In children under six months 66 per cent proved fatal. Young shows by statistics that the mortality varies directly with the degree of fever present; every case with a temperature of 104·2° to 106° F., and at least 50 per cent of those with temperatures between 100·2° and 104° F., were fatal. His figures also show a surprising frequency of blood in the stools; 88·2 per cent showed this feature, a figure which suggests that most of his cases—seen in Boston, U.S.A.—were more severe than is common in England.

Complications.—In Young's series of 178 cases the most frequent complication was acute *otitis media* (48 cases); the next in frequency was *convulsions*. Other complications were *bronchitis* and *pneumonia*.

Rundle and Harries[3] refer to the frequency of bronchitis in cases of epidemic diarrhœa. Their statistics of otitis media hardly agree with those of Young, for they found it only in 7 per cent of their cases. They point out the frequency of *furunculosis* in summer diarrhœa, and mention two cases in which this complication was successfully treated by a **Polyvalent Staphylococcus Vaccine.**

Vipond[4] mentions amongst the complications the occurrence of *hyperpyrexia*, a condition almost always followed by a rapidly fatal result.

Treatment.—Bowditch[5] considers that the traditional treatment by a preliminary purge is correct in theory and practice, and mentions

as the three most suitable drugs for this purpose **Castor Oil, Calomel,** and **Sodium Sulphate.** Castor oil is contraindicated where vomiting exists ; in such cases sodium sulphate has been found successful. If calomel is used, gr. $\frac{1}{10}$ should be given frequently until one grain has been administered. In the most severe cases, **Starvation** of everything except water is the next important item in treatment, **Water** only being given for a period of from two to ten days, either by mouth or bowel or subcutaneously. The experimental observation that organisms of the coli group in the presence of sugar prevent putrefaction, has led to the use of sugar as a valuable food in these cases ; for not only has it this indirect value in inhibiting putrefaction, but it also furnishes material easily assimilable even by an impaired digestion. **Lactose** and **Dextrose** have therefore been given as rectal irrigations, the former being administered in strength 2 to 5 per cent, the latter in strength 2 to 4 per cent. In each case the sugar was added to an ordinary saline solution. Bowditch, however, was unable to trace any very definite improvement to this treatment.

Silver Nitrate irrigations are also used in 2 to 3 per cent solution, the total quantity being one pint, and preceded by a cleansing enema. Three or four such irrigations may be given at intervals of two to four days.

Tannic Acid irrigations have been used similarly, but the solution most frequently used is the common **Saline Solution**, a teaspoonful of ordinary table salt to a pint of water. Smith[6] emphasizes the value of these silver nitrate irrigations, particularly in cases where blood and pus persist in the stools after the temperature and toxic symptoms have disappeared, but it is also of value in the acute stage. A preliminary cleansing irrigation should be given, but not with sodium chloride solution, as this would precipitate an insoluble salt of silver. A pint of a 3 per cent solution of silver nitrate is allowed to run into the colon ; some of this is expelled after removal of the tube, but no harm is done if some is retained. Smith found that the irrigation gave no marked discomfort, but should any be present it might be controlled by an opium suppository. The injection is repeated once daily until three have been given. If no improvement has resulted then, none is to be expected from further use of the treatment. For twenty-four hours after the first injection the stool appears worse than before, containing blood and grey sloughy material, but subsequently there is marked improvement. The results as shown by statistics prove that this method is only of limited value. Where *vomiting* is combined with the diarrhœa, **Lavage** or **Stomach Washing** is recommended by some writers, but Bowditch has rarely found this necessary, as the vomiting generally responds to ordinary gastric sedatives.

Feeding in Diarrhœa.—Complete abstinence from milk in any shape or form is the first essential. **Boiled Water** alone should be given at first. After four or five days **Lactose** may be added in 5 per cent solution, followed after a few days by some **Cereal Decoction.** In the most severe cases, or when vomiting makes the administration of

these thin fluids by mouth impossible, **Saline Infusions** are given subcutaneously; 8 to 20 oz. may be given per diem in divided doses amounting generally to 3 to 4 oz. A combination of **Dextrose** with the normal saline solution in the strength of 2·5 per cent has been found more effective than the saline alone; it must, however, be stopped as soon as glycosuria appears. The value of subcutaneous infusions has been exploited recently by the lay press in connection with the use of **Sea Water** for this purpose, which was introduced a year or two ago in France. The supposed virtue of the sea water lies apparently in the fact that by addition of spring water it is rendered isotonic with human blood. Whether the particular combination of salts in sea water has any special value in cases of infantile diarrhœa is doubtful; certainly its use by some competent scientific observers has not justified the extravagant claims made for it; any method of supplying fluid to an infant drained of water by severe diarrhœa has, as has been recognized for many years, a life-saving value in many cases, and subcutaneous administration has been practised for a long time for this purpose.

As the infant improves, **Meat Preparations** of one sort or another may be used. Tibbles recommends chicken or veal broth, or a combination of a few drops of bovinine, Valentine's meat juice or Hippi added to albumin water. **Panopepton** also, or beef jelly (Mosquera's) may be used. Bowditch found dilutions of **Sterilized Fat-free Milk** useful; buttermilk also was found valuable as a stage towards the administration of milk. Tibbles mentions **Buttermilk** 10 parts, water 10 parts, sugar 1 part, cream 1 part; but the experience of most will be against the administration of fat shortly after an attack of diarrhœa. He also mentions **Koumiss,** a food in which the proportion of fat is generally low; but in practice it is found that both buttermilk and koumiss are repugnant to most babies, and therefore to be avoided. No doubt the ideal feeding of the infant with diarrhœa during the convalescent stage is that available, according to Talbot,[7] at the Massachusetts Infant Asylum, where resident **Wet Nurses** are part of the organization. Where this is impossible, the method adopted at the Boston floating Hospital may be practicable. By visiting a large number of nursing mothers, a trained nurse was able to find some who had a superabundance of milk. From these milk was drawn daily in sufficient quantity to relieve the mother without depriving her baby of its own share. One case is mentioned in which a mother was able to give over one quart a day. The mothers were paid at the rate of half a crown a quart. Four quarts in all were collected daily. It is obvious that such a method would be life-saving in many instances of chronic diarrhœa.

Vipond[1] advocates the use of **Banana Flour. Plantain Meal** is also of value, though less astringent than banana flour. This latter is prepared by cutting the unripe fruit into thin slices, drying, and then grinding into flour. It contains 3 per cent of proteid, ·5 per cent of fat, 7 per cent of dextrose, 1 per cent of tannin, and 72 per cent of

starch and other carbohydrates. It is manufactured in the West Indies. One teaspoonful to one dessertspoonful is mixed with a little cold water, four or five ounces of barley-water are added, and the mixture is heated to boiling-point. With this the infant is fed in suitable amounts.

Stimulants.—These are almost always necessary at some stage of severe infantile diarrhœa. **Brandy** is most generally useful, but if the pulse is weak and irregular, **Strychnine** gr. $\frac{1}{300}$ to gr. $\frac{1}{250}$ should be given hypodermically. Tibbles recommends $\frac{3}{4}$ min. of liq. strychninæ with 5 min. of ether hypodermically every hour if the vomiting prevents administration by mouth. Anyone who has tried a hypodermic of ether upon himself will be humane enough never to adopt this method of treatment unless the infant is either unconscious or practically *in articulo mortis*. Bowditch mentions also the use of **Camphorated Oil** and **Caffeine,** but does not think these offer any special advantage over other stimulants.

References.—[1]*Lancet*, 1911, i, 580; [2]*Bost. Med. and Surg. Jour.* 1911, i, 299; [3]*Liverp. Med.-Chir. Jour.* 1911, 376; [4]*Montr. Med. Jour.* 1910, 591; [5]*Bost. Med. and Surg. Jour.* 1911, i, 294; [6]*Ibid.* 298; [7]*Ibid.* 304.

DIPHTHERIA. (*See also* Anaphylaxis.) *E. W. Goodall, M.D.*

Etiology.—The questions of the influence on the dissemination of the disease and of the treatment, therapeutic as well as administrative, of *diphtheria carriers* continue to be discussed. In what follows references will be made especially to papers by Arkwright,[1] Macdonald,[2] and Garrett,[3] and to a discussion which took place at the Annual Meeting of the British Medical Association in July, 1911.[4] Diphtheria carriers may be divided into two main classes: (1) Persons who have recently suffered from an attack of diphtheria, but have completely recovered; (2) Those who have not suffered from diphtheria, but in whom diphtheria bacilli can be found on bacteriological examination of the throat and nose. Class (2) may be further subdivided into two groups: the one in which the carrier has been recently in relationship with a case of diphtheria ("contacts"); the other in which no such relationship can be ascertained.

Macdonald and Arkwright add another group, "consisting," according to the latter, "of those persons who are suffering from the disease in a chronic form without constitutional symptoms." [These I regard as mild cases of diphtheria, and as such are excluded from the classes of carriers.—E. W. G.]

In his paper, Arkwright quotes Graham Smith as having collected records of 9,080 cases, upon which he calculated that the bacillus was still present after one month in 19 per cent, after two months in 7·2 per cent, after three months in 2 per cent, and after 200 days in 0·62 per cent. Arkwright states, in reference to the figures he quotes from various authorities, that "taking the figures as a whole, it appears that about one-half of the diphtheria patients are free from diphtheria bacilli within two or three days of the disappearance of the membrane, and of the remainder, probably 50 per cent more are free in another

week or ten days." Discussing the question of the frequency of the bacillus in "contacts," he finds from an examination of the published results that it varies "according to circumstances, such as the closeness of contact and the habits and social position of the population examined." He also states that the persistence of the bacillus in contacts is much the same as in patients, and that probably the contacts do not retain the bacillus for so long. The frequency with which the bacillus is met with in persons who have not been brought into contact with diphtheria, i.e., in communities where diphtheria has not occurred for some time, varies from 0 to 2·5 per cent. According to Graham Smith, the percentage of virulent *B. diphtheriæ* in non-contact communities is very small, about 0·04 per cent.

The frequency of the carrier case having been ascertained with some approximation to accuracy, two questions arise which are of great importance to public health administrators: (1) Is the carrier a danger to those around him? and (2) What treatment is to be adopted in his respect? Arkwright asks the question, "Does a diagnosis of the *B. diphtheriæ* by examination of a film from a young serum culture definitely decide the dangerous nature of this bacillus?" He comes to the conclusion that it does not seem to be definitely settled whether *B. diphtheriæ*, which are typical in every way except that they are non-virulent, have any close causal relationship to cases of diphtheria or not. The evidence, other than bacteriological, regarding the power of carriers to spread the disease, does not favour the supposition that they are particularly potent from that point of view. The so-called "return cases," which are relatively common in scarlet fever, are uncommon in diphtheria. In my opinion, one of the principal factors in the persistent prevalence of diphtheria is not the carrier, but the mild, unrecognized case. The subject is of importance, because upon the view taken it depends whether or not any measures are taken in respect of the carrier. Personally I am veering to the opinion that some of the measures hitherto adopted to lessen the number of carriers in the community are unnecessary, because there is little evidence that the carrier does harm. In some of the hospitals of the Metropolitan Asylums Board it is customary, and has been for some years, not to discharge a patient who has recovered from an attack of diphtheria until at least two consecutive cultivations from the throat or nose have proved free from *B. diphtheriæ*. In others, this procedure is not adopted, but the patients are discharged after at least four weeks' stay in hospital. Yet in the latter hospitals the proportion of "return cases" is no higher than in the former. In Cheltenham, during ten consecutive years, no bacteriological examination of diphtheria patients was carried out, yet, according to Garrett, the disease did not spread, so that routine bacteriological examination before discharge would appear to be superfluous. Antiseptic gargles and swabbings, antitoxin, and vaccination with killed diphtheria bacilli have on the whole not been successful in freeing carriers from bacilli. **Vaccination** seems to be the most promising method to adopt

in the case of a chronic carrier who appears to be a source of infection. One such case has been recorded by Walton Smith.[5] He used as a vaccine a mixture of 6 million diphtheria bacilli and 10 million staphylococci (these organisms having been present in the cultures in addition to diphtheria bacilli). A week later another injection of eight million bacilli was given. In four cases (unpublished) of persistent bacilli after diphtheria, I have injected small quantities of an **Endotoxin** extracted from the bacilli by Prof. Hewlett. In all four the bacilli quickly disappeared. But the cases are too few for a definite conclusion.

In children in whom the persistence of the bacilli appears to be associated with *enlarged tonsils or adenoids*, these should be removed by operation.

Symptoms.—In a paper on the *blood-pressure* in diphtheria, J. D. Rolleston[6] gives an account of observations on 179 cases of diphtheria. He states: (1) The blood-pressure was found to be subnormal in 35 per cent, the extent and duration of the depression having, as a rule, a direct relation to the severity of the faucial attack. (2) In the great majority the highest readings were found in the first, and the lowest in the second, week of disease. The normal tension was usually re-established by the seventh week. (3) In a large proportion of convalescent cases, either the readings in the recumbent and erect positions were the same, or the recumbent was higher than the vertical record until convalescence was firmly established. (4) In laryngeal cases disproportionately high readings were obtained, especially when the dyspnœa was sufficiently severe to require operation. Relief of the obstruction by tracheotomy was followed by an immediate and steep fall of blood-pressure (20 to 40 mm.). (5) The blood-pressure showed little tendency to be affected by the early serum phenomena, but during the late febrile syndrome it was raised in 40 per cent. (6) Albuminuria was accompanied either by a fall or by no change in the blood-pressure, except in a case of uræmia, in which there was hypertension. (7) In early paralysis, the blood-pressure tended to fall; in late paralysis, even when extensive, it was usually not affected. (8) Sphygmomanometry in diphtheria has little practical significance. (9) Adrenalin therapy in diphtheria may favourably influence the other symptoms of suprarenal insufficiency without affecting the blood-pressure.

During the past few years attention has been directed to forms of *cutaneous diphtheria* clinically different from those previously known, and cases of vesicular and bullous eruptions of considerable chronicity, apparently due to the diphtheria bacillus and cured by antitoxic serum, have been reported in the *Annual*. A case of anomalous cutaneous eruption, associated with the presence of a bacillus morphologically corresponding with that of Klebs-Löffler, and clearing up under treatment by diphtheria antitoxic serum, has been recorded by Kenneth Wills.[7]

Two cases of *gangrene of the leg* during convalescence from diphtheria, necessitating amputation, have been recorded by Rolleston,[8] and Ransome and Corner.[9] The one case was a boy aged ten years,

the other that of a boy aged six years. Both patients recovered. Rolleston appends to his account an epitome of all the recorded cases of gangrene of an extremity following an attack of diphtheria in children under fourteen. There are 11 such cases, including the one he reports. The gangrene is due to the blocking of an artery, caused either by an embolism from the heart or by a thrombus forming in consequence of a local endarteritis. Rolleston quotes from a monograph published by Barraud in 1904, to show that gangrene of an extremity after an acute infectious disease is not so common under as over fourteen, and that in children under fourteen typhoid fever accounts for 9 of the 29 recorded cases. Another case has recently been published by H. Kramer, of Piquetburg, Cape Colony.[10] The patient was a girl aged eleven years, and the gangrene set in during early convalescence.

Diphtheria of the vulva in little girls is not such a very rare affection; usually it accompanies, and is probably secondary to, diphtheria of the nose or fauces. A case recorded by Alfred Howell[11] is unusual because the disease was limited to the external urinary meatus, and no other mucous membrane was affected. The local lesion did not by its appearance suggest diphtheria.

A case of *ulceration of the skin round the inner canthus of the right eye*, and chronic inflammation of the pharynx, nose, and vulva, due to the bacillus of diphtheria, is reported by Bankes.[12]

Mercury Colloid is well spoken of by Stephens (*page* 25).

REFERENCES.—[1]*Brit. Med. Jour.* 1910, ii, 1508; [2]*Lancet* 1911, i, 795; [3]*Public Health* 1910, Dec.; [4]*Brit. Med. Jour.* 1911, ii, 326; [5]*Austral. Med. Gaz.* 1910, Oct. 20; [6]*Ann. Rep. Met. Asyl. Bd.* 1910, 267; [7]*Brist. Med.-Chir. Jour.* 1910, 231; [8]*Brit. Jour. Child. Dis.* 1910, 529; [9]*Lancet* 1911, i, 94; [10]*Brit. Med. Jour.* 1911, ii, 505; [11]*Pract.* 1910, Nov.; [12]*Brit. Med. Jour.* 1911, ii, 17.

DISINFECTION OF HANDS.

Alcohol (*page* 4). **Chiralkol** (*page* 12). **Eusapyl** (*page* 15). **Iodine** (*page* 21).

DISLOCATIONS.

Priestley Leech, M.D., F.R.C.S.

Spontaneous Forward Dislocation of Wrist Joints.—Cases of this deformity, which is also known as "Madelung's deformity," are

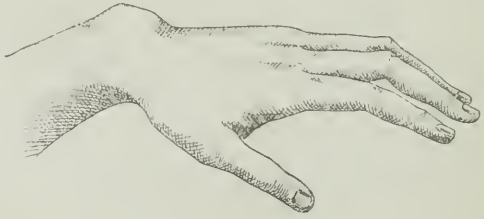


Fig. 57.—Spontaneous forward dislocation of left wrist.

reported by Stokes[1] and Stetten.[2] The carpal bones are dislocated forwards, and the line of the ulna with the carpal bones presents a

marked anterior curve at the point of articulation of the carpal bones with the ulna. The radio-carpal articulation does not present so marked an angle as the ulno-carpal. Extension in both hands was limited, and forcible extension gave great pain. The other movements

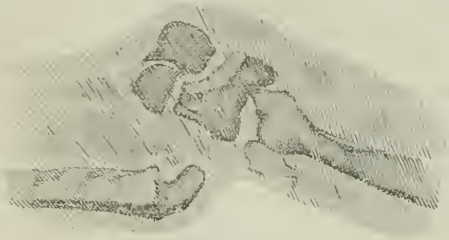


Fig. 58.—Diagram showing relation of ulna to carpal bones.

were normal. The etiology of this condition is not known. French authors think that occupation or trauma could produce the deformity ; some say it is a symptom of rachitis. Madelung thinks that a primary

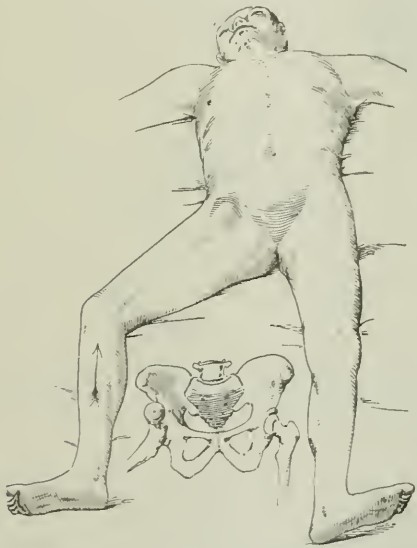


Fig. 59.—Anterior dislocation of the head of the femur. The head of the bone is just below Poupart's ligament, making a visible projection there. As the Y ligament is unruptured the thigh is strongly everted. The knee is slightly flexed and the foot rests on its outer border. The arrow indicates that the flexion at the hip-joint preliminary to reduction should be accomplished by external circumduction of the femur.

bone degeneration is indispensable ; and that the flexors of the forearm, being so much stronger than the extensors, pulled the radius backwards, and held the carpal bones forwards, thus producing a partial

separation of the scaphoid and semilunar from the radius and ulna. Stokes comes to the following conclusions: (*a*) The dislocations occur usually in people of the lower class, many of whom show signs of rickets. (*b*) There are a dystrophy and an atrophy in the carpal bones, cartilages, and epiphyses, with an occasional hypertrophy of the dorsal side, and the diaphysis of the radius is curved anteriorly. (*c*) Radical treatment is indicated only for cosmetic purposes. Symptoms must be controlled by palliative means. (*d*) Heredity, the female sex, and certain occupations are predisposing factors to this disease. Most cases are in young people. The symptoms disappear after twenty-five. The treatment is counter-irritation, rest, and overfeeding. Osteotomy and splints rarely do any good.

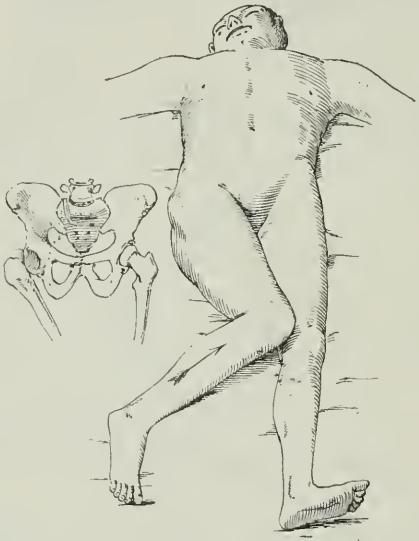


Fig. 60.—Posterior dislocation of the head of the femur. The head of the bone lies on the dorsum ilii, and, as the Y ligament is unruptured, the thigh is strongly inverted. The knee is flexed and the foot rests upon its inner border. The arrow indicates that flexion at the hip-joint preliminary to reduction should be accomplished by internal circumduction of the femur.

Dislocation of the Hip.—A very useful means of remembering the steps of Bigelow's method for the reduction of dislocations of the hip is given by Monks.[3] For practical purposes it is sufficient to note whether the dislocated head of the femur lies anterior or posterior to the acetabulum (*Figs.* 59, 60). The posterior dislocation is comparatively common; the anterior is extremely rare. In reducing a dislocation of the hip the surgeon stands on the patient's left side (if the left femur has been dislocated the surgeon stands between the patient's legs), with his left foot advanced close to the patient's pelvis; and while an assistant holds the pelvis firmly to the floor, he grasps the lower

leg (his right hand being around the leg just above the ankle, and his left one supporting the leg just above the tuberosities of the tibia), and flexes the lower leg at the knee and the thigh at the hip. In the process of doing this he should make the knee describe a horizontal curve, which is either inward or outward according to the dislocation. At the end of this manœuvre the head of the bone is presumably just beneath the torn part of the capsule, and therefore the surgeon then forcibly lifts the thigh directly upwards (it is often better at this stage for the surgeon to slip his left forearm under the upper part of the patient's lower leg, so as to get more power in lifting), when the head of the bone usually slips into place. The most difficult point to remember is whether the surgeon, when he flexes the thigh upon the pelvis, should make the knee describe an inward or an outward curve. If the surgeon, as the patient is lying on the floor, will imagine that there is on the exposed side of the patient's lower leg an arrow pointing in the direction of the knee (when that is flexed), this arrow will indicate the direction in which he is to carry the knee while he is flexing the thigh upon the pelvis (*Figs.* 59 and 60).

REFERENCES.—[1]*Ann. Surg.* 1910, Aug.; [2]*Surg. Gynec. and Obst.* 1909, Jan.; [3]*Boston Med. and Surg. Jour.* 1904, Feb. 25.

DISSEMINATED SCLEROSIS.

X-ray treatment (*page* 75).

DUODENAL ULCER. *Robert Hutchison, M.D., F.R.C.P.*

ETIOLOGY.—Paterson[1] calls attention to the frequent association of duodenal ulcer and disease of the appendix, which was first pointed out by W. J. Mayo. Paterson has found it in 66 per cent of the cases of duodenal ulcer in which he has operated. He suggests that the association is too frequent to be regarded as a mere coincidence, and thinks that appendicular disease may be a cause of duodenal ulcer, possibly by means of toxic absorption from the appendix or colon. Such absorption may give rise to a condition of inflammation of the gastric mucosa, which prepares the way for erosion, and finally for chronic ulceration. (*See also* GASTRIC ULCER.)

DIAGNOSIS.—Mendel[2] describes a method which he has found of great value in the diagnosis of gastric and duodenal ulcer. It consists in light percussion of the epigastrium with a percussion-hammer. If ulceration be present, *an area of acute tenderness* can be mapped out. In the case of a duodenal ulcer this area is about the size of a florin, and lies just to the right of the middle line and a little below the mid-point between the costal margin and the umbilicus. As the ulcer heals, the area of tenderness gradually contracts, and finally disappears; it can therefore be used as an index to the healing of the ulcer and a guide to treatment.

X-ray diagnosis (*page* 66).

TREATMENT.—Hort[3] describes again in detail his method of treating cases of duodenal ulcer, which is already fairly well known. It consists

in (1) Rest in bed for not more than a fortnight; (2) Attention to the state of the mouth and teeth; 3) Regulation of the bowels; (4) A diet of frequent meals composed mainly of meat. He gives the following as a sample menu: At 1 p.m. and 7 p.m., beef, mutton, or lamb, as joint, steak, chop, cutlet, etc., lightly cooked but not raw, fresh, tender, and served in fresh gravy, without vegetables. This should be the entire meal, except for toast or one or two rusks, if preferred, with butter. For breakfast, toast, butter, and eggs lightly cooked. For tea, the same, with, if necessary, a little hot water to drink. At 11 a.m., 2 oz. to 3 oz. of raw beef-juice freshly made, and again at 9 p.m. During the night, if disturbed by pain, small sandwiches made of stale bread containing freshly pounded chicken or game may be given, also fresh. During the first week of treatment this dietary is gradually worked up to. Once established, it should be continued for at least a month after the ordinary occupations have been resumed. (5) The administration of **Normal Antilytic Serum** by the mouth.

With regard to the method of administration, normal serums in cases of open ulcer should never be given to starving patients or on an empty stomach, as troublesome and even serious symptoms may ensue. He generally prescribes serum in chronic cases of gastric or duodenal ulcer in doses of 10 c.c. three or four times a day, immediately after food, in ½ oz. of cold water. It must be atoxic, as proved by injection into guinea-pigs, and sterile, as shown by the same method or by attempts at culture. It should be stored, if possible, on ice, and is better not preserved by addition even in small quantities of antiseptics, as its antiferment activity is thereby seriously impaired If kept in a sufficiently cool place its activity is not seriously affected even after a year by mere keeping. If there is the slightest reason from its appearance to suspect deterioration from autolysis, it should not be used, as otherwise severe gastrointestinal irritation may be set up.

In acute cases with severe initial hæmorrhage, and in chronic cases with acute exacerbations, treatment is primarily that of severe hæmorrhage. Immediate and **Absolute Rest** is, of course, essential. If the bleeding still continues, or recurs to an alarming extent, good results are sometimes obtained by promoting cerebral anæmia by raising the head. This failing to arrest the bleeding in really urgent cases, the rapid but careful passing of a well-oiled tube just past the cardiac orifice, with a funnel attached to the distal end, followed by the injection of a few ounces of iced water, is said to be sometimes followed by gratifying results. In all cases showing great disquiet, a preliminary **Hypodermic Injection of Morphine and Atropine** is useful. Ergot by mouth or skin, or adrenalin solution, is of no value; calcium salts of less. **Amyl Nitrite Inhalations** are sometimes of slight service. Ice-bags on the epigastrium give occupation to the patient's friends, but they do not help the patient, may even greatly increase the pain, and certainly aggravate stasis of the gastric contents. Injections of gelatin may be followed by cessation of bleeding, but are subsequently painful and

are not free from risk. Food by the mouth is as a rule out of the question so long as hæmorrhage is severe; food by the bowel except for a day or two gives a feeling of false security, and is synonymous with starvation, even if given in large quantities. The injections repeated if necessary two or three times, at intervals of three hours into a vein, or under the skin of the flank or axilla, of **Normal Horse Serum**, guaranteed as fit for injection, is of the utmost value. Sometimes it fails. Injections may have to be repeated once or twice for a day or two after the initial day of hæmorrhage. As soon as twenty-four hours have elapsed after the bleeding has ceased to be alarming, food by the mouth should be carefully begun. The following is a suitable scheme of diet for cases in which the worst bleeding is over :—

First Twenty-four Hours.—Every three hours during the day 2 or 3 dr. of freshly made chicken jelly alternating with half the yolk of a lightly boiled egg can be given. Occasionally the jelly increases the pain, in which case half an ounce of fresh raw beef-juice, double the ordinary strength, can be given. Cold water in 1-oz. doses may be given to allay thirst.

Second Twenty-four Hours.—Three or four drachms of pounded chicken may be given after boiling and rubbing through a hair sieve, alternating with raw beef-juice and the whole yolk of a lightly-boiled egg, intervals of two and a half hours separating the meals. During the night the interval may be increased to four hours.

Third Twenty-four Hours.—Pounded chicken, pounded meat, and the yolks of eggs can now be given every three hours in rotation, in rather larger quantities. Hot water is now useful in 5-oz. doses if slowly sipped, and if not given within an hour of a meal.

The subsequent dietary must be graduated according to the presence or absence of indications of recurrence of hæmorrhage. If this has quite ceased, rapid progress can be made. If it still continues, a day or two longer should be spent in very careful dieting, repeating once, or more often if necessary, injections of iced water into the stomach. During the days or hours in which at any time hæmorrhage is a cause of anxiety, free purgation with suitable salts is often necessary and always useful.

References.—[1]*Lancet*, 1911, Jan. 14; [2]*Deut. med. Woch.* 1910, Sept. 15; [3]*Brit. Med. Jour.* 1910, Dec. 17.

DYSENTERY.

Cantani advises **Protargol** enemata (*page* 36).

DYSENTERY, AMŒBIC. *Leonard Rogers, M.D., F.R.C.P.*

C. H. Garin[1] reports in detail a case of amœbic dysentery originating at Lyons, in the absence of any discoverable infection from a tropical patient, and refers to others reported from France, Germany, Austria, and Russia.

Treatment. — Brem and Zeiler[2] record very successful results from the use of **Ipecacuanha** in the treatment of *chronic intestinal*

amœbiasis at Colon, in the Panama Canal zone. They had previously used copious salt and quinine enemas, but had never succeeded in eradicating amœbic dysentery. The bismuth treatment advocated by Deeks and Shaw had also failed in their hands. After four years' experience with rest, dieting, and lavage of the colon, they despaired of ever curing intestinal amœbiasis. Since they tried large doses of ipecacuanha, they have cured fourteen amœbic infections. Of these, eleven patients had amœbic dysentery, eight of whom were proved to have remained free from amœbæ for from six weeks to five and a half months, and the other three for shorter times. Three more cases with amœbæ in the stools, but without dysenteric symptoms, were similarly cured, but in four other such cases the amœbæ persisted without symptoms, being possibly more resistant. They are therefore of the opinion that a large proportion of amœbic infections can be eradicated by the ipecacuanha treatment, which is far superior to all others and should always be thoroughly tried before surgical methods are resorted to. The cases are fully reported, and Case 3 is of especial interest, as appendicostomy and irrigations through the appendix for eight weeks had failed to cure, yet ipecacuanha subsequently did so. Pills coated with salol to a thickness of one-sixteenth of an inch were used, beginning with 60 to 80 gr. a day, and reducing the amount by 5 gr. each day until a 10-gr. dose was reached, which may be continued longer if necessary, though this is not often the case. No solid food or milk should be given for six hours before the dose is administered at about 8 p.m., and no food at all for three hours before. No opiate is necessary, but the patient may be kept lying on the right side to facilitate the passage of the pills through the pylorus. As the dysentery had lasted from several months up to two or more years in most of the cases related, the success obtained is very remarkable and fully confirms Indian experience on the subject.

H. W. Pilgrim,[3] in opening a discussion on the ipecacuanha treatment of *acute hepatitis* in Calcutta, criticized the opinions of two London surgeons, with tropical experience, disparaging the value of ipecacuanha in cutting short an acute hepatitis and preventing the occurrence of tropical liver abscess. During sixteen years' practice at the Calcutta European hospital he had much experience of the disease, and there was no doubt that hepatitis, usually of three weeks' duration at least, preceded the formation of liver abscess in the great majority of cases. He regretted that in past years he had watched a considerable number of cases of definite hepatitis going on for some time and culminating in liver abscess. In a few cases, especially in intemperate persons, the disease may develop more rapidly, while occasionally liver abscess may arise insidiously with very little fever, and the pre-suppurative stage may be overlooked by the unwary. He was also of the opinion that dysentery, either manifest or latent, is the cause of the great majority of liver abscess cases, while alcohol is a powerful predisposing cause. He had always been a firm believer in ipecacuanha in the treatment of dysentery,

especially the amœbic variety. During the last three years he had also used it regularly in acute hepatitis. The hospital figures show that about an average of 200 cases of dysentery (mostly amœbic) and 82 cases of hepatitis are treated yearly. Yet under treatment with ipecacuanha, "during this period of three years, not a single case of dysentery has been complicated with hepatitis, and every case of hepatitis has recovered without passing through any stage of suppuration." As a result, the cases of liver abscess treated in the hospital have fallen to about one-third of the previous numbers. He also quoted figures supplied by Firth to Rogers, showing a reduction of the death-rate in the British Army in India from liver abscess, during the three years following Rogers' advocacy of ipecacuanha, to one-third of the former stationary rate. F. P. Drury[4] agreed with Pilgrim's views. He had been struck with the value of the drug in hepatitis with threatening suppuration, which appears to be averted by its use. In the last year and a half he had treated thirty-six cases of hepatitis, with only one death. J. T. Calvert[5] often used **Sulphates** in the treatment of dysentery, but in dangerous types of tropical dysentery he trusted to ipecacuanha, which rarely failed him if not left until too late. His recent experience had convinced him that in hepatitis following dysentery, ipecacuanha will cure the disease, provided the inflammation has not gone on to suppuration. It was just possible that a small abscess might encyst under this treatment. He had found the Madras plan of mixing 10 gr. of tannic acid with 20 to 30 of ipecacuanha of great value in preventing vomiting, possibly acting by checking the flow of gastric mucus excited by ipecacuanha.

E. D. W. Greig[6] had studied the blood changes in a number of cases of dysentery and liver abscess. He had confirmed Rogers' observations that a leucocytosis, usually with a normal proportion of polynuclears, gave the first indication of amœbic infection of the liver. He had found that full doses of ipecacuanha in the early stage of amœbic hepatitis produced a fall both in the temperature and leucocyte curves, and the symptoms disappeared, while in a control without the drug no such improvement was noted. In a case in which the temperature remained high after two amœbic abscesses had been opened, the use of ipecacuanha was followed by a rapid fall of both temperature and leucocytes to normal, with recovery, further extension of the infection of the liver being apparently prevented. A. H. Nott[7] had until quite recently been extremely sceptical as to the value of ipecacuanha in dysentery, mainly as a result of gaol experience with bacillary forms. Following Rogers' writings he had tried the drug in acute hepatitis, and had become absolutely convinced of its value. During the last year he had also had three or four striking examples of the value of ipecacuanha in the treatment of liver abscess, after aspiration and injection of quinine solution into the cavity without drainage.

L. Rogers[3] in the debate on the foregoing papers mentioned that at the Calcutta European Hospital negative aspirations for liver abscess had practically ceased to occur, because every doubtful case is

first treated with ipecacuanha and cured if an abscess had not already formed. In view of the above unanimous experience, there could no longer be any doubt that in the vast majority of cases amœbic abscess of the liver is an easily preventable disease, and should now become a very rare occurrence in Europeans who come early under skilled treatment. The same author[9] writes on liver abscess as an important and easily preventable cause of death in the British Army, pointing out that the death-rate from this disease was recently second only to that from typhoid fever, and had shown no tendency to decrease during the thirteen years up to 1906. For the last three years, since his advocacy of ipecacuanha as a preventive of liver abscess, the mortality in the British Army in India from that disease has rapidly fallen to only 40 per cent of the former rate, and should soon be nearly done away with.

Edward B. Vedder[10] records very important experiments proving conclusively the powerful action of **Emetin,** the alkaloid of ipecacuanha, in destroying pathogenic amœbæ. Moreover, a 2 per cent fluid extract of ipecacuanha inhibits the growth of the dysentery bacilli, especially that of Shiga. It would, however, be difficult to obtain such a strength in the large bowel by giving the drug by the mouth. On the other hand, a fluid extract of from 1–50,000 to 1–200,000 at once killed the amœbæ in cultures in five per cent bouillon. The action depends on the amount of emetin in the drug, the Brazil root containing the greatest amount. De-emetized ipecacuanha has very little action, although advocated some years ago in dysentery. As the emetin is absorbed into the circulation, it may act on the amœbæ in the tissues of the large bowel and in the liver, which he considers will explain the good results reported by Rogers in the treatment of hepatitis and early liver abscess by ipecacuanha.

References.—[1]*Sem. Méd.* 1910, 397; [2]*Amer. Jour. Med. Sci.* 1910, ii, 669; [3]*Ind. Med. Gaz.* 1910, 332; [4]*Ibid.*; [5]*Ibid.*; [6]*Ibid.*; [7]*Ibid.*; [8]*Ibid.*; [9]*Jour. R.A.M.C.* 1910, 155; [10]*Jour. Trop. Med. and Hyg.* 1911, 149.

DYSENTERY, BACILLARY. *Leonard Rogers, M.D., F.R.C.P.*

Etiology.—Orton and Dodd[1] deal with *dysentery infection through flies* in an epidemic at the Worcester State Hospital, Massachusetts. The incidence of the disease was gradual and irregularly distributed, so it was not due to water. The Shiga type of bacillus was isolated in 10 out of 15 cases examined, and they agglutinated in high dilutions with Shiga serum. Experiments were carried out by exposing cultures of *B. prodigiosus* in the kitchen and laundry, and catching flies in sterile traps, containing sterile sugar syrup, placed in the wards. Each day's catch of flies was given access to large agar dishes, which were examined for red colonies up to seventy-two hours. It was estimated that 4,000 flies visited the baits during six days' exposure. Positive results were obtained within two days and later from every one of the five wards and from the kitchen 300 to 450 feet away. Prevention of breeding of flies was therefore essential. Howard had shown that the female fly lays 120 eggs, which require 10 days for the larval and

pupal stages, after hatching in eight hours. Horse manure forms the best breeding-ground, but pig manure, barley malt, and brewery waste are also very favourable. Spreading vegetable waste on ground and ploughing in every ten days is an effectual preventive. Manure should be kept in closed vessels and one pound of chloride of lime added to every eight quarts.

M. M. Canavan[2] records further studies on *endemic dysentery* at the Danvers State Asylum. During eighteen months cases were persistently present, although more prevalent in the hot months. Screening a portion of the hospital from flies no doubt prevented some cases. Dysentery bacilli were recovered from 35 out of 68 cases examined, both types being found.

G. H. K. Macalister[3] deals with *dysentery carriers*, having studied the subject in a large Midland lunatic asylum. Healthy persons, who have never suffered from dysentery, may rarely harbour the organism, but they are comparatively unimportant. Much more important are convalescent carriers. In 28 acute cases dysentery bacilli were isolated, the Flexner type being commonly obtained from stools containing blood and mucus, but much more rarely after the stools had become normal. The serum test was positive up to a 1–100 dilution in 17 out of 25 acute cases, and is of great value, while the reaction frequently persists for over one year. If any symptoms of ill-health recur, the cases may be still infective. Relapse or chronic disease was present in 26 per cent of the infections, 53 per cent completely recovered, while in 20 per cent a persistent serum reaction with occasional mucus in the stools was noted. All incomplete convalescents should be strictly isolated.

TREATMENT.—Ruffer and Willmore[4] report further results of the *serum treatment* of dysentery at the El Tor pilgrim camp. They have prepared a **Polyvalent Serum** by the subcutaneous injection of various strains of dysentery bacilli into horses, beginning with one agar tube of dead cultures and going up to 80 tubes of living cultures at a dose. The serum thus obtained completely agglutinated the bacillus up to dilutions of 1-1000, but was more active against the Shiga type than against the others used in its preparation, and the protective power was also greatest against the same organism. The results of the use of this polyvalent dysentery serum, in the treatment of the very severe and frequently gangrenous type of the disease found in the aged and worn-out class of pilgrims met with at El Tor, have been very satisfactory. In the purely bacillary cases the death-rate in 1909 was 64·4 per cent, but during 1910 it was reduced to 10·8 per cent. On the other hand, the mortality of the purely amœbic cases was 91 per cent, and the serum appeared to be useless. The best results were obtained in cases of pure infection with the El Tor variety of the dysentery bacillus, namely, a death-rate of 5·7 per cent. In severe cases a dose of serum was given on admission, without waiting for the results of the bacteriological examination of the stools and the agglutination test. The latter often gave negative results, both in

very early cases and in very severe ones, especially in old men. Only in pure amœbic cases was the serum withheld. Large doses of the serum were used, beginning with 40 to 60 or even 80 c.c. subcutaneously in the flanks. The doses were frequently repeated as required, as much as 320 c.c. having been given within twenty-four hours, while one gangrenous case was successfully treated with 520 c.c. No bad symptoms resulted from these doses; even serum rashes were but rarely met with, nor did any abscesses or other local trouble occur.

E. Poucel[5] deals with the **Surgical Treatment** of severe dysentery, and recommends the opening of the ileum to form an artificial anus, so as to prevent any fæcal matter entering the large bowel, combined with appendicostomy to allow of irrigation of the colon. Such a severe measure is advised only in very chronic and desperate cases.

W. Gillitt[6] publishes a further report on *gaol dysentery* in India, with special reference to the use of **Bacterial Vaccines** in its treatment and prophylaxis. During nineteen months 70 cases had been treated without any fatalities, or, including previous figures, among 190 cases no death has occurred. The incidence of the disease has also fallen greatly. He discusses the possible influence of other conditions, but does not think that either improved sanitation, unusually healthy seasons, or the diminution of flies, which has been marked during the last two years, will account for the decline in the disease, which he therefore confidently attributes to the use of Forster's vaccine. This has been given both in the treatment of all cases, and as a prophylactic measure in all new admissions to the gaol with any history of past dysentery or diarrhœa, in order to prevent their becoming carriers of infection. Amœbæ have been found only in 2·8 per cent of the 70 cases, bacillary dysentery being by far the commonest form in Indian gaols. [This is in marked contrast to the incidence among the general population as seen in civil hospitals in Lower Bengal.—L. R.] He thinks that many of the cases which occurred were not true dysentery, but that the symptoms were due to irritants taken by the mouth by the prisoners, or to local irritation self-induced, and that few of the cases during the last year were true bacillary dysentery. [This would largely account for the absence of fatal cases.] In bacillary cases, marked improvement follows the vaccine within five or six days. In one amœbic case it failed to have the slightest effect, but this was cured by ipecacuanha. In worm cases, appropriate treatment is indicated.

References.—[1]*Bost. Med. and Surg. Jour.* 1910, ii, 863; [2]*Ibid.* 1910, ii, 219; *Brit. Med. Jour.* 1910, ii, 1506; [4]*Ibid.* 1910, ii, 1519; [5]*Sem. Méd.* 1910, Oct. 26; [6]*Ind. Med. Gaz.* 1911, 130.

EAR, DISEASES OF.

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Otitis Media.

Etiology.—Murray[1] concludes that a large proportion of people are subject to some aural defect. Disease of the middle ear furnishes from 65 to 70 per cent of all aural diseases, and is responsible for

about 85 per cent of all cases of deafness. About 90 per cent of middle-ear disease is caused through the Eustachian tube.

Adenoids in children are complicated by ear diseases in at least 30 per cent. This etiological fact is important from the point of view of prevention, according to Barnhill,[2] who says it is rare to find a child with well-developed adenoids, untreated till the age of ten, in whom there is not an easily discoverable loss of hearing. When nasal and nasopharyngeal disease is eradicated before the onset of aural complications in the individual, the latter will usually be prevented. When the aural affection is allowed to become chronic, the value to the ear of nasopharyngeal treatment becomes progressively less effective in proportion to the degree of chronicity.

On the other hand. Pattee,[3] of Colorado, while admitting the value of intranasal surgery, removal of tonsils, adenectomies, and the like, believes that when it is remembered that complete obstructions in both tonsils may continue for some time without affecting the hearing; that the pernicious furore to attack every irregularity within the nose has led to a large amount of unwarranted operating in the nose and throat; that intranasal operations have frequently been done on patients whose conducting apparatus had already been injured by pathological processes; that adenoid operations have often failed to ameliorate the symptoms for which they were performed; that we can have middle-ear inflammation and suppuration without enlarged tonsils and adenoids—when we remember these things we can begin to rate, at something like their true value, other lines of treatment, and question whether surgical operations are always of the transcendent importance assumed.

On various occasions he has been strongly impressed with the fact that soft-tissue obstructions are much less general and of a milder grade in a dry than in a humid climate. In high altitudes and dry climates acute purulent rhinitis in children almost never occurs, and acute obstructive conditions of the soft parts are much less severe. A large percentage of cases of secretory and dry catarrhal otitis media, which develop in a damp, changeable climate, and which are aggravated by inclement weather, improve in a dry climate and may be permanently arrested, unless there is already too much disease of the sound-conducting mechanism.

Woods[4] alludes to otitis media following *infectious diseases*, at an interval long enough to throw doubt on causative relation. Either there is latent tympanic infection after the acute disease, or a new ear infection. For instance, a child has measles and passes through the attack without ear symptoms. Two or three weeks later, without other symptoms, and when recovery is seemingly complete, otitis media develops. Such cases are not uncommon after measles and grippe. In a few there is the typical order of pain, fever, and otorrhœa, unless the case was seen before perforation. In others, sudden return of fever was the only symptom, and otitis was found because the physician looked for it or had it looked for.

Diagnosis.—It must be remembered that non-purulent discharge may come from the pinna or meatus, as well as from the middle ear or cranium. When from the pinna—not uncommon in children—a daily application of 5 per cent solution of **Silver Nitrate** combined with **Boracic** or **Yellow Oxide Ointment** produces prompt improvement. Discharge in the meatus when due to eczema may be treated in the same way (Mollison[5]).

Treatment.—Weston and Kolmer[6] have treated with **Bacterial Vaccines** a large number of cases of suppurative otitis media following scarlet fever. Of 2,537 patients, 308, or 8·2 per cent, developed suppurative otitis media. One hundred cases extended over a period of nine months, and were treated with autogenous vaccine with good results, the period of the discharge being considerably diminished. *Staphylococcus aureus* was found alone in 14 cases ; *S. albus* in 2 cases ; *B. pseudodiphtheriæ* in 35, *B. pyocyaneus* in 20, and *Strept. pyogenes* in 4 cases. *Staph. aureus* and *B. pseudodiphtheriæ* were found together in 9 cases ; *Strept. pyogenes* and *B. pseudodiphtheriæ* in 4, *B. pyocyaneus* and *B. pseudodiphtheriæ* in 9, *Strept. pyogenes* and *B. pyocyaneus* in 3 cases.

If no improvement was noted after the third dose of vaccine, or if ten days elapsed before vaccine could be administered to a case after culture had been taken, a re-culture was made and a new vaccine prepared.

The initial dose for the average patient ten years of age was about as follows : *Staphylococcus aureus* and *albus*, 15 to 40 millions ; *B. pseudodiphtheriæ*, 30 to 50 millions ; *Streptococcus pyogenes*, 5 to 10 millions ; *B. pyocyaneus*, 50 to 80 millions.

It is well to give a small dose at first and note the extent of the reaction. This will be a good guide in determining the size of the succeeding dose. Doses are repeated every five to eight days.

Following the administration, the majority of patients develop a temperature varying from 100° to 102° F. in about eight hours, gradually reaching normal in twenty-four to thirty-six hours. "We have seen the temperature fall a degree or so to subnormal after an injection, reaching normal at the end of twenty-four hours. A second dose should not produce so much fever, and when doses are properly selected, the temperature reactions are quite conspicuous, each being lower than the preceding, as the patient's system is charged with an increasing quantity of opsonins, until finally no fever follows the administration. The local reaction is usually quite typical. If one has succeeded in securing the organism producing the infection, its vaccine will produce an increased amount of discharge for twenty-four to thirty-six hours. This is of good prognostic value. The discharge may gradually diminish in amount, or cease suddenly and entirely. The general improvement in health in many of the patients was striking. In addition to the temperature and local reaction, the patient, if old enough to express himself, will sometimes complain of lassitude, sleepiness, slight headache, etc. We have been fortunate enough to escape abscess formation."

Under vaccine treatment 21·99 per cent of cases are cured in from one to thirty days, as compared with 7·46 per cent under usual treatment in the same period of time.

The following are *contraindications* to the administration of vaccines: (1) Cases of continued fever; (2) Acute nephritis; (3) The occurrence of other infections means cessation of vaccine treatment.

The *technique* of preparing the vaccines is very fully described by the writers.

McDonald[7] reports thirty cases of subacute and chronic otitis media treated with **Vaccines** with good results in the main. In nine cases he found a short, actively motile Gram-negative bacillus, which grew readily on any media. The cultures had a very foul odour, like that of the discharge. In such cases there was little or no improvement after a course of seven or eight inoculations. In cases in which the staphylococcus, streptococcus, or pneumococcus was the causative organism, either alone or combined, the patients were markedly improved or entirely cured. Cases in which the staphylococcus and *Bacillus pyocyaneus* were present, improved more slowly than those with the staphylococcus alone.

He says that in subacute otitis media no other means of treatment is capable of producing such uniformly good results as vaccines. Their early use would greatly diminish the large number of chronic cases.

Kopetzky[8] has had good results from autogenous vaccine therapy in acute cases, and in chronic cases without bone lesions, as the following table shows:

Groups of Cases	Numbers	Cures	Improved	No Results
Chronic suppurative with bone lesions ..	6	—	1	5
Chronic suppurative without bone lesions	5	4	1	—
Acute middle-ear suppuration	4	4	—	—

In acute cases, after the period of violent onset and its co-existing constitutional reaction has subsided, the added immunity acquired through vaccine therapy seems rapidly to cure the diseased ear. The drawback to its use, which must greatly limit its application except in institutions, is the technique and time required.

Thiosinamine and its derivative **Fibrolysin** appear to possess a peculiar property of softening but not destroying cicatricial tissue. This action does not occur in healthy tissue unless therapeutic doses are exceeded. Its effect is rapid, but of passing character, and it can only be an auxiliary to mechanical treatment. Although stated to be an inoffensive agent, it has been attended in a number of instances with untoward results.

Its use was proposed in 1897 in otology for cases of *adhesive otitis*, with varying results from different observers, vaunted by some, condemned by others. Yearsley[9] gives careful clinical histories of 20

cases (7 males, 13 females), in which he used the remedy. In 3 there was no improvement; in 16 the results were doubtful. Seventeen cases had tinnitus; but only in 2 was it improved by treatment. The author has doubt even about the action of the fibrolysin in those cases which he reports improved. He concludes that whatever may be its effect upon cicatricial tissue elsewhere, it has no action upon pathological fibrosis in the middle ear.

Yearsley[10] reports seventy **Ossiculectomies,** with results as follows:—

Hearing		Discharge	
Improved	19	Cured	41
Unaltered	8	Improved	3
Worse	3	Recurred, but easily cleared by treatment ..	4
Not stated	40	Recurred and lost sight of	4
		Failed	13
		Still under treatment ..	5
	70		70

In the discussion which followed this report the consensus of opinion was against the operation, as being equally dangerous to the hearing as the radical procedure, with a relatively small number of cures.

The **Conservative radical Mastoid Operation** first brought to general attention by Heath is beginning to have numerous advocates; one of the latest being Mahu,[11] of Paris, who concludes that the petro-mastoid excavation, conservative of the tympanic membrane and the ossicles, may be performed in a sufficiently large number of non-deaf otorrhœics, well selected from the otoscopic and hearing points of view, even when the tympanum may not be absolutely intact, provided they fulfil the following conditions: no serious destructive lesions of the tympanum and attic, no cholesteatoma, no labyrinthine disturbances, good aerial hearing, Rinné test positive, Gelle test positive. It is particularly indicated if the subject is very young, or is deaf in the opposite ear.

It includes all the steps of the complete petro-mastoid exenteration save the last—removal of the ossicles and the remains of the tympanic membrane. The preservation of the attic wall is optional, according to the case. After the operation, an active supervision of the operation cavity and of the labyrinth is indispensable, particularly during the dressings. According to the nature of the lesions the posterior wound may be closed immediately, using a large retro-auricular flap; or the retro-auricular opening may be left to close progressively.

Dighton[12] reports several cases of mastoid operation after the same method, and claims that it is followed by restoration of hearing. So little information is afforded, however, in the way of functional tests before and after operation, that this claim is hardly proved, the watch being in most cases the only test used. [This operation has a place, but its field must be somewhat limited. Many cases similar in character

to those reported should be curable by still more conservative methods, namely, careful local treatment through the canal without any mastoid operation.—G. L. R.]

Stacke[13] favours this operation; comparing it with excision of the ossicles he considers the results better.

By the conservative method, one is able to preserve at least as much hearing as existed before the operation, and it may be much better. Out of 51 cases operated on by him, in 20 there was improvement in hearing, in 24 it remained unchanged, in 2 it was made worse, in 5 cases the results were not known at the time they were reported. The great advantage of the conservative operation is that nothing whatever has been destroyed, and that excision of the ossicles or the conversion into the usual radical, still remains possible, and where there is good, fair, or even poor hearing power, he considers the conservative method, as compared with excision, the superior one, provided that the tympanic membrane and the tympanic cavity still remain.

When the operation is finished, he considers it desirable to have the tympanic cavity, as regards the external canal, completely closed off. To accomplish this result, it is necessary that no portion of the tympanic ring remains. This technique consists in the preservation of the ossicles and the tympanic membrane, and the successive opening of all neighbouring spaces, attic, aditus ad antrum, and the removal of all the bony substance covering the antrum, so that all the spaces are freely open from the outside, as in every radical operation. He uses the same plastic as formerly described by him. He is enabled in this way to preserve the ossicles and tympanic membrane.

Where the fistula lies behind the short process he allows the anterior part of the outer wall of the attic to remain, the head of the hammer, however, remaining visible. The back wall of the auditory canal is always taken away, down to the plane of the facial nerve. The ossicles themselves are touched as little as possible, even when they are covered with granulations. These may shrink also in the course of the treatment, and carious places which are present heal. The tympanic membrane, even in the case of perforations or loss of a portion of its border, is often found bound down to the inner wall, so that the tympanic cavity is frequently not opened by the operation. In other cases it was unavoidable to open up the tympanic cavity, the membrane being loosened by the operation. Here the free edge heals again almost without exception.

He thinks that opposition to the radical operation is based on unsuitable choice of cases.

Healing after Mastoidectomy.—When the mastoid wound does not heal properly within a reasonable time, Reik[14] cleans the wound thoroughly, curetting wherever necessary and removing any scar tissue which may have formed, and then sutures the wound. In cases also in which one fears to attempt primary union at the time of operation, the method of secondary closure is attempted at some later date when the local infection has been certainly controlled, if not

eliminated. When the patient is convalescing, the wound can be cleansed and closure made with every assurance of safety and healing.

Welty[15] finds the use of the **Thiersch Graft** lessens the duration of the after-treatment following the radical mastoid operation, and gives better results as to the hearing. Four days after the operation the Thiersch skin-grafts are applied, the patient being re-anæsthetized, the granulations removed, and the cavity made perfectly dry with hot saline, hydrogen peroxide, and adrenalin.

The first graft is fastened with a searcher into the tube, bringing it out over the floor of the tympanic cavity posteriorly; the second, superior to the first, is brought back over the facial into the mastoid cavity. The third usually covers the remaining wall of the attic and antrum. The three that have been used are the larger ones. The uncovered areas that are now left are covered by the remaining grafts, the one being selected that will cover the denuded area best. Small pledgets of cotton are now used to fix the grafts, so small that they do not touch either surface while being put in place. The first one is put over the tube, the second firmly applied to the posterior superior quadrant, the next over the stapes, and so on until all the grafts are held well in place, so that they will not be materially disturbed when a dry tampon is introduced. The size of this tampon corresponds to a piece of gauze 4 in. to 6 in. square. After the dry gauze a similar piece of gauze is saturated with the oil of vaseline (Cheseborough), and packed within the mastoid cavity. After this a similar piece, in size larger or smaller as the occasion may demand, is inserted to fill the entire cavity made by the operation. The posterior wound is now closed in the usual manner. It will be found that an additional tampon by way of the meatus will assist materially in holding the plastic in the desired position, resulting in a very large meatus, with cut surfaces all within the ear.

He claims that never before in the history of otology have eighteen cases been brought to healing in so short a time.

Complications.—Amberg[16] reports on **Transillumination of the Mastoid** after the method of Dintenfass, who introduced small cylindrical lamps 2 cm. long, 1·5 cm. wide, with a rounded tip, into the external auditory canal until only the cable winding is visible. The region of the mastoid process presents a reddish tint when transilluminated, in the shape of a slice of orange. It is brightest at the place of attachment of the auricle, and decreases gradually backward. There is increase of shadow when pus is present. It is an aid to diagnosis, but by itself can be of but little value.

Intracranial Complications.—Of ten cases reported by Turner and Reynolds,[17] *Streptococcus pyogenes* was the virulent organism in seven, *Strept. pneumoniæ* in one. Of the two remaining cases, one with meningitis gave a growth of *B. aerogenes capsulatus* in the cerebrospinal fluid, and the other, with sinus thrombosis, a Gram-positive diplococcus was obtained.

Aural Tuberculosis in Children.—Milligan[18] says, the exact *frequency* of tuberculous otitis media is difficult to estimate, for very little is known about the incubation period of tuberculosis. Certain it is that, so far as infection of the middle-ear cleft is concerned, the vast proportion of cases of primary tuberculous otitis media occur in infancy and childhood.

The avenues along which tubercle bacilli travel to effect an entrance into the middle-ear cleft are: (1) Aerial, i.e., the Eustachian tube (respiratory tuberculosis); (2) Lymphatic, along various lymph channels leading from adjacent tuberculous foci; (3) Vascular, or blood infection from the respiratory or digestive canals; (4) Aero-lymphogenous, through the lymphoid and along the subepithelial collections of lymphoid tissue in the pharynx and nasopharynx, and also around the lumen of the Eustachian tube, bacilli being carried inwards by means of leucocytes, often without any demonstrable lesion of the epithelium; (5) Through a perforated membrana tympani; and (6) Through erosions of the dermic lining of the external auditory meatus.

There is no one particular *symptom* pathognomonic of tuberculous otitis media. Certain signs and symptoms, however, taken collectively, make up a typical picture; the painless onset, the absence of inflammatory reaction, the frequent presence of two or more perforations, the early appearance of enlarged peri-auricular glands and facial paralysis. The almost invariable presence of caries or carionecrosis serves to explain the frequency with which facial paresis or paralysis is met with. The position of the Fallopian aqueduct, and its frequently incomplete ossification, renders it liable to attack, with consequent erosion and exposure of the facial nerve.

A Diagnosis of aural tuberculosis is by no means always easily made. The various clinical signs and symptoms already detailed are highly suggestive of the tuberculous nature of the disease. To verify the diagnosis it is, however, necessary to discover the bacillus in the discharge from the infected middle-ear cleft, or in tufts of granulation tissue or portions of diseased bone removed by operation or exfoliated by disease, or to produce experimental tuberculosis in animals inoculated with products from the diseased ear.

The finding of bacilli in the discharge is admittedly hard, partly on account of the small number which may be present, but more particularly on account of the frequent presence of other acid-fast bacilli. A more certain method of diagnosis is the examination of portions of tufts of exuberant granulation tissue removed from the depths of the tympanum.

Prognosis in all cases should be guarded. In the primary form it is more favourable than in the secondary. The death-rate is certainly high; and even if a fatal issue does not result, the difficulties encountered in effecting a complete arrest of the disease are great. The younger the patient when infected the greater the risk and the more rapid the spread of the disease.

Treatment.—Local treatment (irrigation with antiseptics and the employment of antiseptics) is practically valueless. **Removal of Adenoids,** in such cases themselves frequently tuberculous, and of **Enlarged Tonsils,** should be effected as a preliminary to any other form of treatment.

Seeing that every individual who has contracted tuberculosis is capable of conveying it to others, the question arises how far it is justifiable to allow such children to mix with others, especially in school, where large numbers are collected together, often in small and not too well-ventilated class-rooms. Milligan himself considers that they should be segregated, and every endeavour made to raise their powers of resistance.

Otosclerosis.—Bruhl[19] considers the best name for the lesion present in otosclerosis to be " spongy hyperostosis " in the oval window. Are there, he asks, any conditions in this region which favour such a change ? In order to elucidate these problems he submitted his preparations to Prof. Gebhardt, the well-known authority upon transformations of bone. His opinion agreed with that of Bruhl, viz., that the changes in the bone which lead to the typical ankylosis of the stapes are the result of the action of forces of traction and compression. Immediately in front of the oval window the tendon of the tensor tympani passes over the " arciform fasciculus " on its way to the malleus ; secondly, the movement of the stapes is more extensive in the anterior than in the posterior pole of the oval window. The continual pulling of the tendon, together with the friction of the foot-plate of the stapes on the anterior border of the foramen ovale, produces an incessant movement of the periosteum and an irritation of the bone lying between the tendon and the angular ligament of the stapes. The cartilaginous covering of, and the cartilaginous residua in, the bone at this place render it very liable to transformation. To sum up, the traction and friction induce hyperæmia and a tendency to proliferative processes in the periosteum and in the bone.

As a rule, the formation of hyperostosis remains limited to the oval window ; but in some varieties isolated areas of transformed bone may also be found elsewhere in the capsule of the labyrinth. In such cases the focus in the vicinity of the stapes is the oldest. We may therefore assume that the production of the diffused foci is set going by the initial deposit at the oval window.

Aural Syphilis. — McKenzie[20] lays down the general rule that internal ear deafness and vertigo, coming on between the age of five and twenty-five years, and not due to any other obvious reason, is due to congenital syphilis. In treatment, the usual remedies fail. Antisyphilitic remedies should be given during infancy to lessen the chance of serious ear mischief in later life.

Alexander[21] reports some unfavourable cases after the use of **Salvarsan** due to previously existing diseases of the vestibular nerve which presented a point of weakened resistance to the action of the arsenobenzol ; from which he concludes that in acute syphilitic disease

of the auditory nerve, caution in the use of salvarsan is necessary ; also in acute or chronic disease of the auditory nerve in a syphilitic person, even though the auditory nerve disease may not itself be of syphilitic origin. In cases of hereditary syphilis it is better to wait until the manifestations of trouble in the auditory nerve have subsided, before giving salvarsan. (*See also* SALVARSAN.)

OTITIS INTERNA : INFECTIVE LABYRINTHITIS.

SYMPTOMS.—Bárány[22] continues to elaborate his work on *nystagmus and labyrinth diseases*. He divides the affections of the labyrinth into twelve different conditions, which can be detected by investigation of thirteen points, as follows : (1) Spontaneous nystagmus ; (2) Spontaneous nystagmus behind opaque spectacles (Bárány) ; (3) Attacks of nystagmus produced by rapid head movements (Bárány) ; (4) Caloric reaction (Bárány) ; (5) Turning reaction with use of opaque spectacles (Bárány) ; (6) Galvanic reaction ; (7) Fistula symptom ; (8) Disturbancs of equilibrium—(*a*) Spontaneous ; (*b*) Experimentally produced (Bárány) ; (9) Hearing ; (10) Dizziness ; (11) Nausea and vomiting ; (12) Position in bed ; (13) Ringing in the ears.

Normally these reactions are as follows :—Spontaneous nystagmus is absent, or there is a small rotatory and horizontal (+ R) nystagmus to the right on maximal turning of the eyes to the right, together with the same to the left in looking to the extreme left (L +). Behind opaque spectacles there is an absence of spontaneous nystagmus in looking straight to the front. No nystagmus is seen during quick motions of the head. (In smokers slight attacks are sometimes observed.)

Caloric reaction : right ear, head erect, water 25° C., produces + R ; during slight narcosis cold water syringed into the right ear produces deviation of the eyes to the right, and hot water deviation to the left. In deep narcosis no movement is produced by hot or cold water syringed into the ear. Turning nystagmus behind opaque spectacles : ten turns to the right, head erect, produce nystagmus to the left 42 seconds ; ten turns to the left, nystagmus to the right 42 seconds (approximately—minimum 5 seconds, maximum 2 minutes). Galvanic nystagmus : cathode in right ear, anode in right hand, nystagmus to the right ; anode in right ear, cathode in right hand, nystagmus to the left (5 to 15 milliampères).

Fistula symptom is absent. Spontaneous disturbances of equilibrium are absent. In neurasthenics there may be a slight disturbance of equilibrium of non-vestibular character. During experimentally-produced nystagmus (after rotation to the right) the patient falls to the left if the head is erect. With the head turned to the right he falls to the front. With the head turned to the left he falls backward.

Hearing may be normal or otherwise. Dizziness is absent, except occasionally in smokers. Vomiting is absent ; during experimentally-produced nystagmus it is often present, especially in neurasthenia and

traumatic neurosis. Position in bed has no significance. Ringing in the ears may be present or absent.

In examining for *spontaneous nystagmus* the patient must look at the examiner's finger held one metre from his eyes. *Opaque glasses* may be made by covering an ordinary pair of glasses with white paper. To examine the nystagmus, raise the upper lid of the eye, and observe it under a bright light for a minute or two. To examine the *nystagmus caused by rapid head movements*, the observer places himself directly in front of the patient and observes one of the eyes, while the patient is directed to look alternately to the right and the left.

For the *caloric test*, slow irrigation is sufficient. This should only be used when there is no perforation of the drum. In case of the latter, use air instead of water. To examine for *turning nystagmus*, a turning chair which is not raised or lowered by rotation should be used, and the turning should be done with uniform velocity: ten revolutions should take about twenty seconds. A *galvanic test* in the presence of spontaneous nystagmus gives a more doubtful result. To examine the *fistula symptom* the patient should look straight forward, the head mirror with a good light being used to observe his eye. The ear must be closed air-tight. To examine the *disturbance of equilibrium*, the patient stands with closed eyes and feet together. Experimental falling is tested by producing rotary nystagmus by syringing with hot or cold water.

The *hearing* is tested by the usual methods. Bárány recommends his noise machine to exclude the non-tested ear. *Dizziness* is the subjective symptom of vestibular rotation, and varies greatly. *Ringing in the ear* is often present in spontaneous attacks of dizziness.

The subdivision of cases into a dozen different categories, and the elaboration of the various tests with primary and secondary nystagmus, and the rather indefinite nomenclature, render this subject a difficult one to follow with practical results for operative indications. The elaborate and detailed schemes of symptoms worked out and compiled according to the fundamental rules of Bárány and his followers may be of but small service in the individual case, unless, indeed, we have them reduced to some diagrammatic basis to which we can refer, as the eye-surgeons do in cases of diplopia from ocular palsies.

Such are the mnemonic tables proposed by Adam,[23] in which things opposed to one another are designated as + and —.

Hot water
Right ear
Head erect
Nystagmus to right
} are called + and the reverse —

TABLE I.—CALORIC TEST.

Ear	Head	Water	Nystagmus
+	+	+	+
+	+	—	—
—	+	+	—
—	+	—	+

TABLE 2.—ROTATION TEST.

(Rotation + = to right. − = to left.)

Rotation	Eye Deviation	Ear Tested	Nystagmus	Fall
+	−	−	−	−
−	+	+	+	+

TABLE 3.—FISTULA TEST.

Ear	Pressure	Nystagmus
+	+	+
+	−	−
−	+	−
−	−	+

Compaiatively recent observations and studies by Bárány have been devoted to an analysis of the cerebellar functions in equilibrium, rotation reactions, and ocular motion, and their interrelation with the labyrinth, normal and diseased. He has found two reactions of practical value—those of falling in a certain direction, which may be varied by placing the head of the patient in special positions, and the pointing reaction concerned in moving the hand and arm to the right or left after continued rotation and induction of rotatory nystagmus.

[The term " rotatory " or " rotary " (*sic*) nystagmus appears to have been incorrectly used, to judge from the context, in some translations of Bárány's papers, as the equivalent of " Dreh-Nystagmus," which means nystagmus from turning, i.e., of the patient in the rotating chair. Rotatory nystagmus, or wheel-motion of the eye, consists in a rolling about an antero-posterior axis, a sort of pendulum motion in which the vertical meridian of the cornea is carried through a small arc, and inclines, first nasally and then temporally. Such a nystagmus cannot be toward either right or left, and a phrase such as " rotatory nystagmus to the right " must be interpreted as nystagmus to the right after the patient has been rotated. This nystagmus, as that following caloric or galvanic stimulation, and even the spontaneous labyrinthine form, is in the vast majority of cases a purely lateral twitch and slow recovery, with little, if any, oblique or torsional component.—P. F.]

In cases of ataxia due to cerebellar lesions, neither the nystagmus nor the position of the head bore any relation to the direction of the tendency to fall. The effect of irrigation of the meatus on the reaction of cerebellar ataxia cases is definite and unequivocal. Provided we have to deal with a normal labyrinth, the usual nystagmus is induced, either by minimal stimuli, and in an excessive degree in the case of a hypersensitive, inflamed vestibule, or by the usual degrees of irritation in the form of a normal reaction. Irrigation of the meatus ipso-lateral with the cerebellar lesion leading to functional defect will produce no effect on the direction of falling, while on the other side the cerebellar factor will still be in action and typically modify the swaying and direction of the fall.

The typical directions of the fall may be summed up as follows. With a tendency to fall to the right, turning the head 90° to the right

causes backward falling, while turning the head in the opposite direction, i.e., 90° to the left, induces falling forward. With a tendency to fall to the left, these reactions are naturally reversed; thus, turning the head to the right causes forward falling, and turning the head to the left causes falling backward.

While these reactions appear somewhat arbitrary and involved at first sight, we have merely to consider the position of the head in its relation to the body, to get the key to them. Thus, with a tendency to fall to the right, if the head be turned 90° to the right the right ear is now back over the right shoulder, and falling will be backward but still toward the right (ear). Turning the head to the left will bring the right ear forward over the right breast, and any falling will be forward, but still toward the right (ear) and in accordance with the scheme. The net result of these falling reactions would be to indicate the absence of the usual cerebellar control in cases of *destructive* lesion of one or other lateral lobe. As to the effect of an *irritative* lesion, such as a small inflammatory or hyperæmic area, or even a small new-growth, Bárány assumes that there would be an excessive reaction ipso-lateral with the cerebellar lesion.

The test involving arm and hand motions was based on observations of ipso-lateral arm ataxia in cases of cerebellar abscess or tumour, and the procedure employed was that used by oculists in testing for limitation of ocular motility in palsies. As is well known, there is a tendency to overreach or overpoint in the direction in which an eye-muscle is paretic, as the direction is judged or estimated by the amount of volition put into the muscle in fixing, and as this is excessive, the faulty conclusion is drawn that the object is situated further to one side than it really is. Bárány found that a similar false orientation can be induced in normal individuals after inducing a physiological nystagmus, causing a deviation to the right in pointing if there is a normal left-directed nystagmus, and vice versa. The conclusion is, that if disease of the middle lobe causes spontaneous falling, disease of the lateral lobes will produce spontaneous deviation in pointing. In case of a destructive cerebellar disease the pointing deviation will be absent on the side corresponding to the lesion, while it can be elicited with ease on the sound side.

The key to this reaction is given in a consideration of the physiological reaction to turning. The rotational, or other, irritation of the labyrinth which corresponds to and produces nystagmus to the left, is sensed as subjective movement to the left of the entire body. With this there is a feeling of objects moving to the right, of space having been shifted to the right, and in an attempt to compensate for this, an instinctive body motion to the right and over-innervation of all right-turning or right-directed motions. This may be so excessive as to cause staggering or actual falling to the right, and is usually so interpreted, i.e., as falling to the right, but to draw the correct conclusions from this reaction, and to ascribe to it its real character as a plus rather than a minus reaction, as excess power rather than as weakness,

we should always think of it as a throw rather than a fall. To sum up, the falling reaction indicates a normal control which is probably exercised by the middle lobe of the cerebellum. In destructive lesions it is absent. The pointing deviation is under control of the lateral lobes of the cerebellum of the same side.

Pathology.—Goerke[24] says that apart from epidemic cerebrospinal meningitis, the labyrinth is rarely attacked from the cranial side ; but even an abortive or transitory meningitis of this type may be dangerous, as in the deafness of epidemic mumps and those cases incorrectly diagnosed as primary labyrinthitis. Middle-ear disease is the far more frequent cause, and if we include tuberculosis and cholesteatoma the chronic form is particularly dangerous, as these two varieties lead most often to vestibular complications. Of the acute forms, that accompanying scarlet fever seems unusually virulent. Simple septic infection often takes place during an acute exacerbation of the tympanic disease, and may be excited by traumatism, such as the removal of polypi, curetting, and so on. Meningeal infection of the labyrinth may pass through the aqueductus cochleæ, in which case the labyrinthine disease is found chiefly in the basal whorl of the cochlea, while the vestibule escapes wholly or partially. In infection via the internal auditory meatus and nerve channels, both vestibule and cochlea are equally involved. Invasion from the tympanic side necessitates breaking down anatomical barriers : a pathological route.

The favourite site for the breach of the outer wall are the fenestræ and the external semicircular canal, the former being more common and more apt to lead to acute labyrinthine infection from the tendency of pus and granulations to form and stagnate in the niche. Infection by way of the circulation is possible but doubtful. Serous labyrinthitis may be caused as a collateral œdema with increased volume and coagulability of the endolymph, while the actual infective agents have not yet penetrated to it. Multiple breaches occur oftenest in tuberculous, cholesteatomatous, and scarlatinal otitis media.

The most important barrier to the propagation of infection is not the bone, but the endosteum or internal periosteum of the capsule of the labyrinth, which shows a plastic exudate on its outer surface going on to granulation, connective tissue formation, and rapid bone production. This protective mechanism often limits the infection to a circumscribed area, and may lead, for instance, to the complete closure of the aqueduct. It is generally insufficient in fulminating cases due to operative trauma, and in extremely sluggish forms of invasion, as tuberculosis, where general purulent labyrinthritis with little or no local reaction, takes place rapidly. Bone production is most marked in the basal whorl of the cochlea and in the semicircular canals, the changes in the vestibule being more usually fibrous. Bone destruction may take the form of necrosis resulting from suppuration, or of rarifying osteitis.

The labyrinthine inflammation may subside without impairment of structure or function, a very rare termination, or a histological

"cure" may be effected by fibrous or bony changes in the exudate. The third and unfortunately commoner termination is meningitis. In addition to the internal auditory meatus and the aqueductus vestibuli or cochleæ, we must consider the possibility of infection passing from the diseased bone of the capsule to the surface of the petrous almost anywhere, but generally at the vertical semicircular canal, and the involvement of the meninges, via an extradural abscess.

TREATMENT.—Bárány's[22] mortality for the last few years is only 2 per cent in 100 operations. In the remaining cases in which death occurred, definite signs of meningitis were present before the operation. In the presence of labyrinthine destruction we are bound to **Operate.** The only question is, when? If we have to deal with an acute labyrinthitis without complications, that is, no fever, no headache, no great amount of suppuration, no tenderness on the mastoid, and so on, we can wait eight to ten days to allow the pus to become encapsulated. In latent labyrinthitis we have no reason to wait. In fistula cases with preserved hearing, dizziness is an indication for eventual operation, while in deaf cases the same symptom is to be considered as more urgent, especially if connected with much subjective discomfort, which, the author notes, varies so greatly in different individuals. After the simple radical operation the dizziness may disappear, the hearing may be preserved, and the fistula may heal, but this is not the usual result. Vertigo, deafness, and fistula, one or all, may persist, in spite of treatment. Fistula in the semicircular canal is not nearly as dangerous as in the oval window. Labyrinthine symptoms in the latter case, therefore, indicate the necessity of immediate operation.

This question is also considered by Goerke[24] and Fletcher.[25] The exact value of the operation, whether in saving life or function, is not yet known. Many cases of the spontaneous form get well of their own accord. This is true of mild circumscribed, as well as of more severe diffuse, labyrinthitis. Also meningitis, for the prevention of which the labyrinth has been opened, may actually be induced by the operative manipulation disturbing adhesions. Surgical opening of the labyrinth can hardly be expected to remove all diseased tissue and provide free drainage. In spite of the most assiduous curettage and removal of all visible pieces of bone, etc., blood clot and bony débris will be found on microscopic examination, which must seriously interfere with the free discharge of pus, particularly at the aqueductus cochleæ and the internal meatus. **Ablation of the Labyrinth** by Neumann's method is the only reliable operation, according to Goerke, for effecting the safe removal of all infective material.

West[26] notes the importance of limiting our operative procedures to removal by curettage of actually diseased tissue at the site of evident infection, avoiding all opening up of structures still presumably normal. The diagnosis of labyrinthine fistula is, however, a sufficient indication for early radical operation. In diffuse infective labyrinthitis, drainage may be effected by opening the vestibule below the facial nerve through the inner wall of the tympanum, or above this structure through the

ampullary region of the attic. The posterior route through the hinder wall of the vestibule is a difficult and awkward one. For further details of these operations, West's article should be consulted.

After-treatment of Vestibulotomies.—As a rule the patient exhibits no special features which would distinguish the case from one of a simple radical mastoid operation. The temperature should be closely watched, any significant rise calling for the immediate dressing of the cavity and the careful consideration of the possibility of commencing meningitis. The first dressing is usually carried out after forty-eight hours.

There is little or no opportunity for the use of **Vaccine Treatment** in cases of labyrinthitis unless they are already complicated by intracranial infection.

Burs are almost a necessity in excavating along the more remote parts of the canals. Any diseased part of the dura mater must be freely exposed and appropriately treated.

No special medical treatment is called for in cases of infective labyrinthitis of pyogenic origin, either before or after operation. The vertigo resulting from the sudden destruction of one labyrinth in acute infective labyrinthitis as a rule subsides almost immediately and completely after operation and with rest in bed. Should it be troublesome, 30-min. doses of **Dilute Hydrobromic Acid,** with 10 gr. of **Ammonium Bromide,** every four hours, will give relief.

Harper[27] draws attention to the grave danger of operating on the mastoid in cases of chronic suppuration before having tested the condition of the labyrinth. Should the operation be performed on a case in which the labyrinth is suppurating, the infection in the labyrinth will get a fresh impetus and cause infection of the meninges, or the ear, continuing to discharge, will at some later date be the cause of brain abscess. As regards those rare cases in which the suppuration in the labyrinth has died down, should the radical operation be performed, this weak spot in the immediate neighbourhood will probably be reinfected, and either meningitis or brain abscess will result. In most cases the onset of acute labyrinthitis is well marked, but not always. The labyrinthine function may be completely destroyed by middle-ear suppuration, while the patients give no history of vestibular symptoms other than, perhaps, attacks of giddiness of no great severity. It is only after careful application of the rotatory and caloric tests that one becomes aware that there is anything more in the case than a chronically discharging ear.

Otitic (Labyrinthine) Meningitis.—Stacke[28] notes that we may hope to save some cases by early radical operation. This can only occur when the strictest attention is paid to the cardinal symptoms, vomiting, nausea and vertigo, fever, intense headache. Vomiting in cases of otitic suppuration is always a grave symptom. The occurrence of these symptoms imposes the necessity of immediate **Lumbar Puncture.** Even in case the cerebrospinal fluid is found to be clear and other complications can be excluded, the radical operation is absolutely indicated in the presence of a chronic purulent otitis media. If the

severe symptoms do not recede, the labyrinth must be freely exposed, always presupposing definite evidence of purulent involvement. Lumbar puncture, repeated at short intervals, will then give assurance of ability, on the first appearance of leucocytes in the puncture fluid, to reach the subarachnoid space at the porus acusticus internus and attack the purulent meningitis. Even this will probably fail to check an already diffuse meningitis, but early operation gives the only chance. The following technique is advised: After the radical operation, and broad exposure of the dura in the middle and posterior fossa, the transverse sinus is laid free in its anterior periphery, and the dura of the anterior surface of the cerebellum prized loose from the posterior surface of the pyramid. The labyrinth is then opened up, by chiselling off the posterior slope of the petrosum and reaching the opening of the aqueductus vestibuli, that is to say, the porus acusticus, by loosening the dura from the bone with a flat spatula and removing the posterior surface of the pyramid with angular, bayonet-shaped chisels. The cerebellar dura is then split medially from the porus acusticus internus to the margin of the sinus, laterally, and the subarachnoid space opened and drained with gauze or tubes.

Aural Vertigo.—Lake[29] has operated upon ten cases since 1904. None of them were connected with suppurative processes. The operation is done in those cases which have no, or only a slight, degree of hearing, which the patient is ready to sacrifice provided that relief is obtained from vertigo. (For details of technique the reader is referred to text-books.)

The labyrinth should be opened both above and below the facial nerve, injury to which is not an uncommon complication. Unless the nerve itself be injured by faulty technique, complete recovery will follow. In the cases reported, the relief justified the operation.

Aural Gymnastics in the Treatment of Deafness.—After a certain amount of practice, contractions of the ear muscles can be produced by volition, as well as by sound striking the organ of hearing. Treatment[30] composed of voluntary and reflex movements should be practised daily. Under voluntary movement, the exercises have for their object the movement of the scalp in various directions (several exercises are described). To favour the reflex movements, close application should be given to listening, as, for instance, to a watch or clock, with either ear, the distance being gradually increased. In cases of chronic hardness of hearing which have resulted from arthritis, aural gymnastics may be an excellent remedy.

A Speculum for Direct Examination and Treatment of the Eustachian Tube.—Yankauer[31] describes a speculum consisting of a tube of a peculiar shape which is introduced into the nasopharynx, and illuminated by means of the ordinary head light. It acts as a palate lifter, and as the anterior wall of that part which lifts the palate is on a straight line with the posterior wall of the part which presses the mouth back, it enables us to bring into view the orifice of the Eustachian tube and part of its anterior wall.

Its introduction is accomplished by placing the beak under the soft palate, while the body of the tube lies across the tongue, and the proximal part of the instrument rests in the angle of the mouth on the opposite side. The patient's head is held backwards as far as possible, and turned to an angle of 45° toward the side which is to be examined. The use of cocaine is necessary for the first few introductions, but the patients soon learn to tolerate the instrument without gagging. The first part which comes into view is the vault of the pharynx, then the fossa of Rosenmüller, the posterior lip of the tube, the orifice of the tube, and part of the anterior lip of the tube. For the exposure of the fossa of Rosenmüller and the posterior lip, cocaine may be dispensed with; but to bring the orifice into view the throat must generally be cocainized.

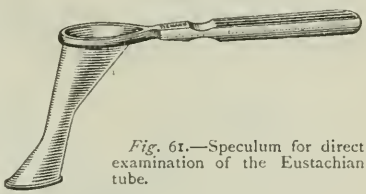


Fig. 61.—Speculum for direct examination of the Eustachian tube.

With this speculum it is possible to remove adenoid tissue from the vault or from the fossa with any kind of straight forceps; to cut adhesions which are frequently seen across the fossa; to make applications to the interior of the fossa; to inflate the ear with a straight catheter; to introduce a small tube into the Eustachian tube and examine its interior.

REFERENCES.—[1]*Jour. Amer. Med. Assoc.* 1911, ii, 549; [2]*Ibid.* 553; [3]*Ibid.* 547; [4]*Ibid.* 1910, Aug. 27; [5]*Brit. Med. Jour.* 1910, Dec. 24; [6]*Jour. Amer. Med. Assoc.* 1911, Ap. 15; [7]*Ibid.* June 3; [8]*N.Y. Med. Jour.* 1909, Oct. 15; [9]*Jour. Laryng.* 1911, May; [10]*Brit. Med. Jour.* 1910, Nov. 26; [11]*Jour. Laryng.* 1911, Jan.; [12]*Med. Press*, 1911, Jan. 11; [13]*Deut. med. Woch.* 1911, Aug. 31; [14]*Bost. Med. and Surg. Jour.* 1911, Mar. 23; [15]*Jour. Laryng.* 1911, June; [16]*Jour. Amer. Med. Assoc.* 1911, Ap. 10; [17]*Jour. Laryng.* 1911, Feb.; [18] *Brit. Med. Jour.* 1910, Nov. 26; [19]*Laryng.* 1911, June; [20]*Ibid.* 1910, Nov.; [21]*Bost. Med. and Surg. Jour.* 1911, Mar. 9; [22]*Brit. Med. Jour.* 1910, Nov. 6; [23]*Jour. Laryng.* 1910, Dec.; [24]*Arch. f. Ohrensheilk.* lxxx, 1; [25]*Jour. Amer. Med. Assoc.* 1910, Oct. 8; 1911, July 22; [26]*Brit. Med. Jour.* 1910, Nov. 26; [27]*Lancet*, 1911, Feb. 18; [28]*Deut. med. Woch.* 1911, June 29; [29]*Lancet*, 1911, June 10; [30]*Sem. Méd.* 1911, Mar. 15; [31]*Proc. N.Y. Acad. Med.* (*Otol. Sect.*), 1911 Feb. 10.

ECZEMA.

Cacodylate of Sodium in (*page* 14). **Glycerin** compresses (*page* 16).

(*Vol.* 1911, *p.* 300)—Abt lays stress on the value of a **Restricted Diet**, especially in infants. Davis found large and frequent doses of **Staphylococcic Vaccine** very effective in an acute case.

ECZEMATOID DERMATITIS. *E. Graham Little, M.D., F.R.C.P.*

Fordyce[1] draws attention to a group of diseases, which though generally classed as eczema, he would differentiate and name as above, following Engman. These are cases secondary to some antecedent lesion or disease such as scabies, furuncles, intertrigo, the common factor of which is pus-infection. By the absorption of the chemical

products of pus he assumes that a specific sensitization to the toxins of the organism concerned takes place, resulting in a special hypersusceptibility which leads to relapses and explains the chronicity of such cases. The normal resistance to the human organism is broken down, and the cutaneous reaction follows. (*See* ANAPHYLAXIS.)

REFERENCE.—[1] *Jour. Cutan. Dis.* 1911, 129.

ELASTIC TRACTION. *Priestley Leech, M.D., F.R.C.S.*

G. A. Wright[1] calls attention to the use of rubber as a means of traction in orthopædic and other branches of surgery. The advantages

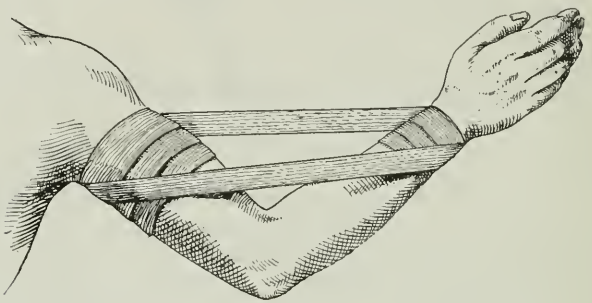


Fig. 62.—Securing flexion of the elbow-joint by rubber bandage.

of rubber over steel springs are: the strength of the tension can be employed through a much wider range and is capable of more ready

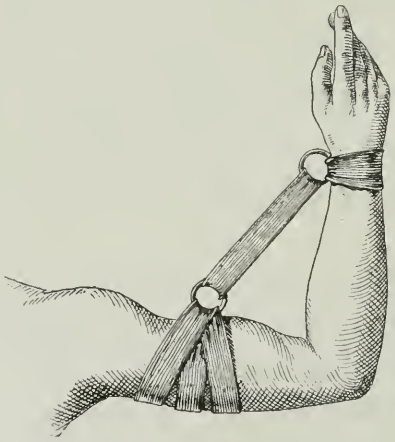


Fig. 63.—Another method. Curtain rings are secured to the arm and wrist, through which the rubber bandage is drawn.

adjustment; it is much easier to apply slighter degrees of traction or pressure, much easier to arrange the line of traction, and any apparatus

may be readily and cheaply improvised. For flexed joints that require straightening, all that is necessary in many cases is the application of a straight splint across the angle of flexion, secured to the limb above and below the joint, but not so tightly as to prevent the lower segment from slipping through the bandages as the limb straightens;

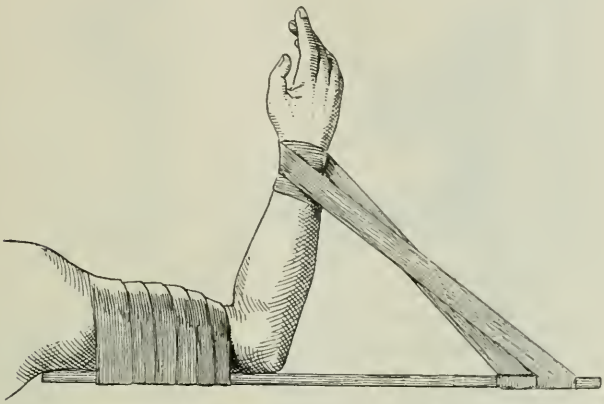


Fig. 64.—Extension of the elbow-joint. A straight splint is secured to the arm by a roller bandage, and extension is made by means of the rubber bandage encircling the wrist.

the joint itself is left bare. An elastic bandage is next applied over the joint and round the splint so as to exert the desired pressure in the required direction. Daily removal of the elastic is necessary to make sure that there is no excessive pressure. Exactly similar appliances

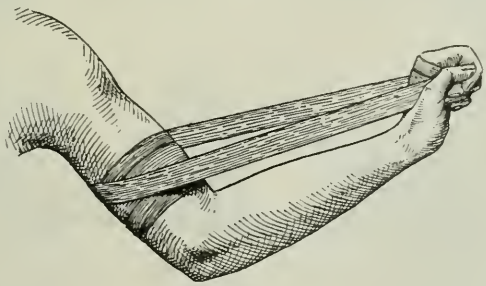


Fig. 65.—Extension of the wrist. The rubber bandage encircles the arm above the elbow and the hand around the palm.

may be used to prevent cicatricial contractions. Plastic traction to the lower segment of the limb may be used alternately with the elastic pressure, or instead of it, if there is any reason why direct pressure should not be applied to the joint.

For *Curvatures of the Shafts of the Bones of the Leg*, a straight splint applied on the concave side, with elastic pressure of the convexity of the curve, will straighten a large proportion. In slight cases of genu-valgum an outside splint on similar lines is quite efficient; there is

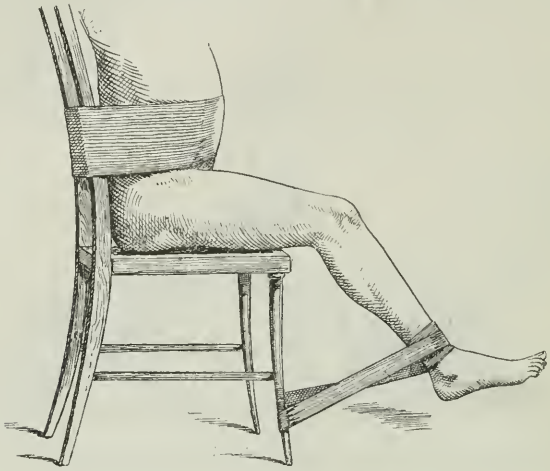


Fig. 66.—Flexion of the knee-joint. The patient sits on a chair and the bandage encircles the ankle and the leg of the chair.

a great tendency for the limb to rotate outwards, and the splint (*Figs.* 68, 69) is designed to prevent this.

Flat-foot, in Wright's experience, is more comfortably and efficiently treated by elastic traction (*Figs.* 70, 71) combined with tip-toe

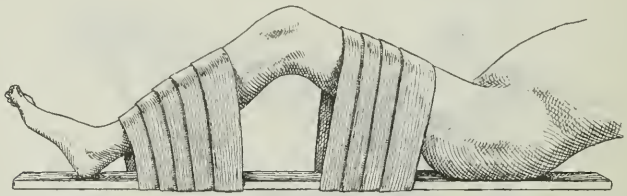


Fig. 67.—Extension of the knee-joint. With the limb on a long posterior splint held by loose gauze bandages, the rubber bandage is made to enclose the knee-joint and splint, thus producing traction.

exercises and thickening of the inner side of the boot. In severe cases adhesions must be broken down and moulding by hand done under an anæsthetic before the "artificial muscle" is applied. In the great group of deformities classed as *talipes*, both congenital and acquired, there is ample scope for the use of elastic traction (*Figs.* 71, 72).

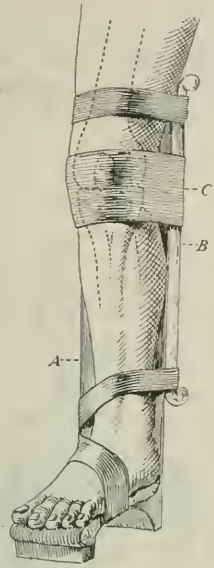


Fig. 68.—Splint or genu valgum. The footpiece is rotated inwards on an axis parallel with the back splint A. The outside splint B forms the chord to the arc of the curved limb; C. The broad elastic band drawing the knee against B, and straightening the limb.

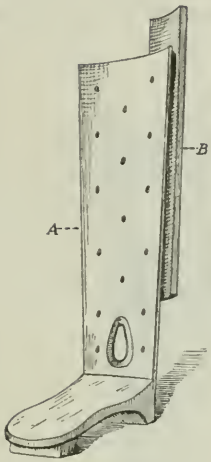


Fig. 69.—Showing details of the splint and rotated footpiece. A. Back splint; B. Outside splint fixed to A.

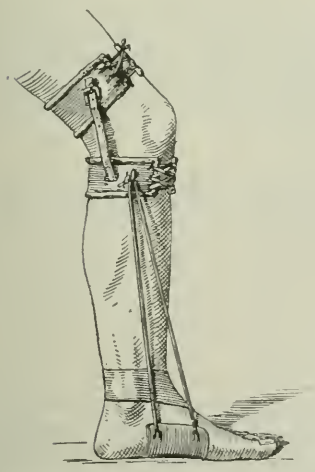


Fig. 70.—"Artificial muscle" applied for flat-foot.

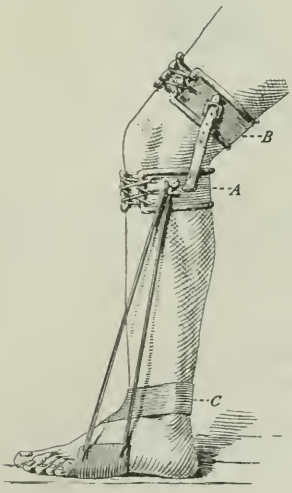
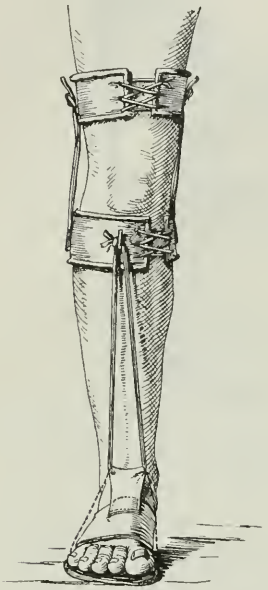


Fig. 71.—"Artificial muscle" applied for talipes equino-varus. A. Leather leg strap with hook; B. Leather thigh strap which keeps A from slipping down; C. Felt band encircling ankle and foot, to which is attached the elastic.

Strachauer[2] recommends the *mobilising of joints* by means of elastic traction. He uses a rubber bandage 2½ inches wide. This is sometimes used alone; in other cases wooden rings are bandaged to the limb by ordinary bandages, and the rubber bandage is carried between the wooden rings. The illustrations show the various ways of applying



A

Fig. 72.—A faulty appliance for equinus. It is better to have the elastic cords attached one on each side of the steel sole-plate **A**, as indicated by the dotted lines.

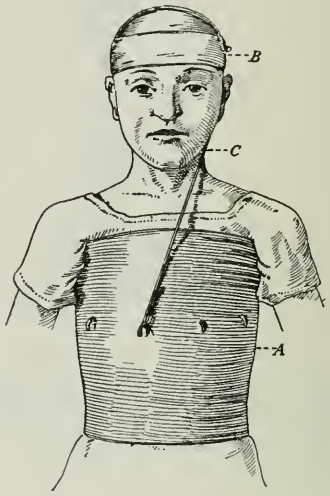


Fig. 73.—Elastic traction applied for torticollis after division of the sterno-mastoid of the opposite side. **A.** Plaster-of-Paris jacket with hooks; **B.** Head band or felt cap, also with hooks; **C.** The "artificial muscle." Another elastic is usually necessary at the back to prevent flexion of the head.

them. Massage, hot and cold baths, high dry heat, etc., are also employed. The rule to be adhered to in using this traction is that the joint should not be tender the next day.

REFERENCES.—[1]*Brit. Med. Jour.* 1910, Nov. 26; [2]*Jour. Amer. Med. Assoc.* 1911, Mar. 11.

EMBOLISM, AIR.

Adrenalin injections for (*page* 3).

EMBOLISM, CEREBRAL FAT. *Priestley Leech, M.D., F.R.C.S.*

Godlee and Williams[1] have a very interesting article on this condition. Among some eighteen patients with fractures resulting from a railway accident, three died at various intervals after the accident with cerebral symptoms, and in two of these on whom a post-mortem examination was made, cerebral fat embolism was found. If the

authors had not been on the look-out for fat embolism, there was nothing in the naked-eye appearances of the brain and other viscera which would have suggested its existence, and it would have been concluded that the capillary hæmorrhages in the brain were the only discernible lesions which could have accounted for death. In both cases the symptoms at first sight resembled those of cerebral compression, but the characteristic pulse of compression was never observed, and there were never any signs in the nervous system pointing to a localized injury to the brain.

Fat embolism may follow fracture of the bones and forcible manipulation of ankylosed joints. The symptoms are as follows : After a latent period varying from six hours to nine days, coma supervenes, sometimes but not always preceded by delirium. The temperature begins to rise with the onset of the coma, and the rise continues until death. Sometimes signs suggesting a local lesion of the brain are present. Fat is present in the urine in all cases. The pulse is rapid and of low tension. Post mortem the brain shows numerous punctate hæmorrhages. In lungs, heart, kidney, and brain, evidences of fat embolism were found. As points in the differential diagnosis from cerebral compression, Godlee and Williams would lay stress on (*a*) the absence of the high blood-pressure seen in cerebral compression ; (*b*) the absence of isolated paralysis ; and (*c*) the absence of fullness of the retinal veins.

Reference.—[1]*Lancet*, 1911, Ap. 22.

EMBOLISM, PULMONARY. *J. J. Perkins, M.B., F.R.C.P.*

Conner[1] is convinced that the sudden pulmonary symptoms which not infrequently precede the obvious signs of a peripheral venous thrombosis are to be regarded as a sign of pulmonary embolism and infarction. He would therefore recognize a type of pulmonary embolism distinct from the severer class in which a patient dies with the symptoms of air-hunger and collapse within a few minutes of the seizure.

The *symptoms* in his cases were thoracic pain, which was almost constant, with a certain degree of cyanosis and dyspnœa, while cough was inconstant. In five of his nine cases blood-stained expectoration was raised at some period, but in three of the cases not till several days after the onset of the pulmonary symptoms. As regards *physical signs*, the cases fell into three fairly distinct groups. In (1) only a few friction sounds or râles were present ; (2) The signs were those of a small circumscribed pneumonia ; (3) Quite extensive pleurisy, with signs suggesting the presence of fluid, was present. His explanation of these cases is that the peripheral thrombosis had already started in small veins, though the main trunk remained unaffected till a few days later, and that from these thrombi small emboli were given off which led to pulmonary embolism and resulting infarction.

Reference.—[1]*Med. Rec.* 1911, Ap. 29.

EMPHYSEMA, SURGICAL TREATMENT OF.

Priestley Leech, M.D., F.R.C.S.

It is difficult to form a definite opinion as to the ultimate beneficial results obtained in cases of pulmonary emphysema by Freund's operation, but where the main factor is calcification, with rigidity, of the costal cartilages, the hitherto published records would seem to indicate that relief can be obtained in judiciously selected cases. Fasano[1] reports a case in a peasant 60 years of age, in whom he had performed this operation three years previously. He operated under local anæsthesia, as the patient was not in a condition to stand a general anæsthetic. The respiration at the end of two years was improved, but the cardiac condition was about the same. In order to prevent regeneration of the resected cartilages, he interposed small muscular flaps between the ends of the resected cartilages, and it appears in this case to have served its purpose.

REFERENCE.—[1]*Gaz. deg. Osped*, 1910, Aug. 14.

EMPYEMA. *Priestley Leech, M.D., F.R.C.S.*

A good method for the treatment of empyema by means of **Differential Pressure** is described by Eberts.[1] By this means the air within the abscess cavity becomes negative in tension during inspiration, and this tends to expand the collapsed lung; there is no odour in the

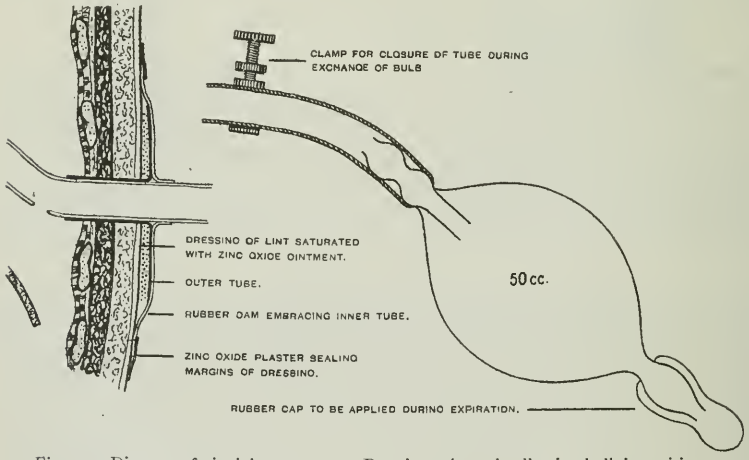

CLAMP FOR CLOSURE OF TUBE DURING EXCHANGE OF BULB
DRESSING OF LINT SATURATED WITH ZINC OXIDE OINTMENT.
OUTER TUBE.
RUBBER DAM EMBRACING INNER TUBE.
ZINC OXIDE PLASTER SEALING MARGINS OF DRESSING.
50 cc.
RUBBER CAP TO BE APPLIED DURING EXPIRATION.

Fig. 74.—Diagram of air-tight empyema. Dressing tube and collecting bulb in position.

sick room, the amount of discharge can be accurately gauged, and frequent dressings are unnecessary. *Fig.* 74 illustrates the method of application. The author makes a circular skin incision, excises the rib with Gigli's saw, and stops the cut ends with Horsley's paste. A further improvement is described later,[2] as shown in the illustrations. The square rubber flange (*Figs.* 75, 76) is fixed to the skin by

means of four strips of zinc oxide plaster (warmed), the upper and lower strips embracing the two poles of the outer shoulder piece. A roller bandage completes the dressing. When the dressing is being changed, the skin should be smeared with zinc oxide ointment and the excess wiped off before adhesive strips are re-applied. If the discharge is profuse, capillary leakage may occur for the first two or three days, but pneumothorax is absolutely prevented. The upward turn of the inner extremity of the tube is designed to prevent painful pressure upon the diaphragm or lung. As the inner wall of the cavity approaches the chest wall, a tube with a shorter projection beyond the cone is employed. If there is no danger of pocketing, the tube may be cut off at the apex of the cone.

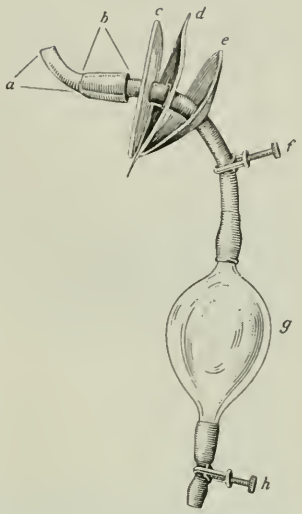


Fig. 75.—Erb's improved moulded drainage tube and glass collecting bulb. *a*, drainage openings; *b*, tapered rubber cone fused with tube; *c*, oval felt pad 4½ x 8 cm., smeared on inner surface with carbolated zinc ointment; *d*, square flange of dentist's rubber dam 8 x 11 cm., with small central perforation; *e*, oval re-enforced rubber shoulder 4½ x 8 cm., with central vulcanized rubber spool to give added stability to the dressing and support to the drainage apparatus; *f*, valve for occlusion of tube while bulb is being changed; *g*, glass collecting bulb; *h*, lower valve to permit of exhaustion of cavity and bulb.

The operation of **Decortication of the Lung** is recommended by Lund[3] as being preferable to the operations of Estländer and Schede in *old empyemata*; there is less hæmorrhage, shock, and mutilation, and if performed in children there is less subsequent deformity of the spine and chest. Lund has operated on seven cases, and thinks that the negative pressure methods used in opening empyemata are not so good as the old method of removal of a portion of one or two ribs and the introduction of the usual drainage tube. If too small an opening is made, there is not a sufficient aperture for the escape of masses of fibrin, and the fingers cannot be introduced to break down adhesions if present. In three of the cases in which he had to do decortication of the lung he had used Thiersch's method of draining the original empyema. Two of the seven cases died, but not from shock; one died from septicæmia and the other from pneumonia of the opposite lung with suspected tuberculosis. The technique is as follows: An incision running upwards and forwards from the anterior end of the

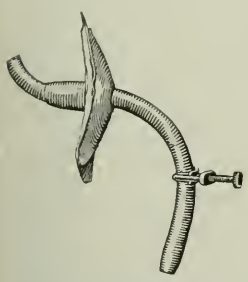


Fig. 76.—Tube with parts arranged for insertion.

old drainage opening is made, and 1½ inches of rib are removed from five or six ribs. The thickened parietal pleura underneath the ribs is then slit up, and if there is bleeding the intercostal arteries are secured. The visceral pleura, which may be a quarter of an inch thick, resembling the rubber sole of an old shoe, is carefully incised over the lower part of the lung. The finger is inserted into the incision, and, as soon as the soft surface of the lung is felt, is swept to and fro with the pulp of the finger towards the pleura, pressing outwards so as to cause as little damage as possible to the lung. Then a pair of blunt-pointed scissors is inserted ; the membrane is slit clear up to the top of the chest, and cleared off from the lung with the finger. If the lung is adherent to the diaphragm, this should be loosened as well. He thinks the **Intratrachial Insufflation Method** of Meltzer and Auer might be of distinct use in these cases.

REFERENCES.—[1]*Ann. Surg.* 1910, Oct. ; [2]*Ibid.* 1911 ii, 58 ; [3]*Jour. Amer. Med. Assoc.* 1911, ii, 693.

ENTERIC FEVER.

Urotropin (*page* 18) ; **Vaccines** (*page* 64).

ENTROPION.

(*Vol.* 1910, *p.* 308)—Ziegler's method is attractive because of its simplicity ; the lid, held in a clamp, is punctured along the skin surface in a series of points parallel with its margin, with the **Galvano-cautery.** No anæsthetic is necessary, but the operation may have to be repeated. Applied to the conjunctival surface, the same method may be used for ectropion.

ENURESIS.

(*Vol.* 1910, *p.* 292)—Williams is impressed with the value of **Thyroid Extract** in the nocturnal incontinence of childhood.

EPILEPSY. (*See also* BRAIN, SURGERY OF.)

Purves Stewart, M.D., F.R.C.P.

CAUSATION.—Whilst various gross intracranial conditions may induce epileptiform convulsions, it is highly probable that genuine primary epilepsy is essentially due to some error of metabolism whereby auto-intoxication results. The tissues of the epileptic patient seem to have lost the power of eliminating or destroying certain poisonous products of metabolism which have a special affinity for the cells of the cerebral cortex. Such toxins gradually accumulate until they reach a certain amount, after which the body seeks to remove them by a cortical explosion. We are still in the dark as to the exact constitution of such poisons. Possibly they belong to the compound ammonias.

TREATMENT.—Our chief medicinal agents are still the various **Bromide** salts, whose efficiency is often markedly enhanced by placing the patient on a **Chloride-free diet** according to the system originally introduced some years ago by Toulouse and Richet. Alcohol should be entirely avoided. Amongst the newer combinations of bromide special attention has been directed by Heinrich[1] to **Spasmosan,** which contains a cold-water infusion of baldrian together with sodium bromide, glycerophosphate of sodium, cascara and iron. A table-

spoonful of spasmosan contains 12 grains of sodium bromide in a solution free from alcohol. Heinrich records twenty-two cases treated with this remedy with satisfactory results, the average dose being a tablespoonful three times a day. As in ordinary bromide medication, the remedy must be persevered with for at least a year or more after the cessation of the fits.

Venesection in (*page* 10).

REFERENCE.—[1]*Epilepsia*, 1911, xi, No. 3.

ERYSIPELAS. *E. Graham Little, M.D., F.R.C.P.*

Choksy[1] finds extraordinary relief of the inflammatory symptoms of erysipelas and cellulitis from compresses of gauze soaked in saturated solution of **Magnesium Sulphate.** The dressings should be wetted every two hours with this solution, covered with oil paper, and removed for inspection once in twenty-four hours. Its effect cannot be easily explained.

REFERENCE.—[1]*Lancet*, 1911, Feb. 4.

ERYTHEMA NODOSUM. *E. Graham Little, M.D., F.R.C.P*

Joynt[1] records three cases of erythema nodosum following *measles*, and mentions six others of which notes were lost, all occurring in an epidemic of some 300 cases of measles. The erythema nodosum occurred usually during convalescence, about ten to fourteen days after the first onset of the rash, and yielded readily to **Salicylates.**

REFERENCE.—[1]*Brit. Med. Jour.* 1911, Ap. 15.

ETHMOID DISEASE. (*See* NASAL ACCESSORY SINUSES.)

EXOPHTHALMIC GOITRE. *Robert Hutchison, M.D., F.R.C.P.*

TREATMENT.—The relative merits of medical and surgical treatment in this affection continue to be much debated. In order to decide upon the value of surgical treatment and its risks, we must first know what is the mortality of cases not submitted to operation. This Hale White[1] has endeavoured to do by following up the after-history of a large number of hospital and private cases of the disease, and comparing the mortality with that which life assurance tables show is to be expected amongst healthy females of the same age period.

Having followed up 49 hospital and 53 private patients in this way, he arrives at the general conclusion that "the expected deaths among sufferers from exophthalmic goitre are somewhat, but not very much, greater than among the healthy; in other words, they are rather "bad lives." As a matter of fact, the total number of deaths in all his patients was 15, as opposed to 8, which was the number to be expected amongst an equal number of healthy women followed over the same length of time. Of the patients that survived—87 in all—61 had done well, and only 5 had not done well; the remainder had done "moderately." On the whole these results must be regarded as very

satisfactory, especially when one remembers that some of the cases had been followed for more than twenty years.

It is interesting, in the light of the above careful observations, to note the remark of Gillies,[2] that it is " a generous estimate " to suppose that 25 per cent of cases get well when treated by rest and drugs ! No wonder he goes on to advise that if a case shows no improvement after three months of medical treatment it should be handed over to the surgeon. Saenger[3] gives very similar advice. His colleague Sudeck[4] states that surgical technique has improved so much that one can expect a " practical cure " in at least 75 per cent of the cases ; and the operative mortality is $1\frac{1}{2}$, or at most 5 per cent. Chvostek,[5] on the other hand, agrees with Hale White in considering the disease a " comparatively benign " one, and announces his intention of sticking to medical treatment. Jackson and Eastman[6] contribute some statistics which may be regarded as supplementary to those of Hale White. They found that of 56 patients who had been under observation for from three to nine years, 76 per cent had had no signs or symptoms for two years ; 13 per cent had been benefited, and only 6 cases (11 per cent) could be considered failures. These authors regard the *neutral* **Hydrobromide of Quinine** as the most useful drug in the disease. It is given in capsules (P. D. & Co.) of 5 gr. up to the limits of tolerance, which does not usually exceed three or four capsules a day. The administration must be continued for months.

Layton[7] reports the results of his experience with **Thyroidectin.** In five cases in which it was administered in doses of 5 to 10 gr. after food, for periods varying from eleven to sixty-one days, he failed to find more than very temporary improvement, and in some the symptoms appeared to be aggravated. Kuchendorf[8] found very good results in two cases from the use of **X-rays ;** and Newman[9] has described a remarkable case, in which great benefit appeared to result from the combined use of *x*-rays locally and **Sour Milk** internally. Hale White[10] believes in rest and feeding up. For restlessness and excitement he prescribes **Bromides** in mild cases, **Paraldehyde** in the severer ones, and **Hyoscine** in the severest of all.

The occasional production of the symptoms of thyroidism by the administration of **Iodine** is referred to by Short,[11] Berg,[12] and Lépine,[13] with illustrative cases. The first-named author considers that the symptoms of iodoform poisoning are brought about in this way.

References —[1]*Lancet,* 1910, Dec. 3, and *Quart. Jour. Med.* 1910, Oct. ; [2]*Austral. Med. Gaz.* 1910, Sept. 20 ; [3]*Münch. med. Woch.* 1911, 16 ; [4]*Ibid* ; [5]*Wien. klin. Woch.* xxiii. 6 ; [6]*Bost. Med. and Surg. Jour.* 1910, Sept. 15 ; [7]*Jour. Amer. Med. Assoc.* 1911, Ap. 22 ; [8]*Deut. med. Woch.* 1910, May 26 ; [9]*Lancet,* 1909, Nov. 27 ; [10]*Loc. cit* ; [11]*Brist. Med.-Chir. Jour.* 1910, June ; [12]*Deut. med. Woch.* 1911, Feb. 16 ; [13]*Rev. de Méd.* 1910, Jan. 10.

EYE, DISEASES OF. (*See* Cataract, Conjunctiva, Cornea, Ciliary Body and Iris, Glaucoma, Lacrymal Apparatus, Ocular Muscles, Orbit, Refraction, Retina.)

EYE INJURIES.

Prof. A. Elschnig, M.D., Prague.

I.—Injuries to the Bony Walls of the Orbit.

Plates X—XIII illustrate the relations of the orbit to the surrounding cranial bones, fractures of which come under our consideration, partly from the cosmetic point of view, partly in connection with the associated injuries to the orbital walls and the foramina transmitting nervous and vascular structures (the optic canal with the optic nerve and the ophthalmic artery, the superior orbital fissure with the ophthalmic vein and the group of sensory and motor nerves of the orbit).

Fractures and fissures of the bony walls may be caused *directly* by violence applied to the margins of the orbit ; or by the penetration of foreign bodies, immediately into the orbit in the majority of instances, much less often through the nasal cavity ; or *indirectly* by injury of the orbital walls (as part of a fracture of the base of the skull) or of the margins of the orbit.

Fissures may be recognized almost solely by the hæmorrhage that accompanies them, or by subcutaneous emphysema which develops when the nose or its sinuses are opened up by a simultaneous rupture of periosteum and mucous membrane: to this we shall return later. Circumscribed hæmatomata within the orbit, such as occur in infantile scurvy, are very seldom seen as a consequence of fissure, in which the periosteum is usually torn and blood poured out into the loose cellular tissue of the orbit, causing proptosis of the eyeball and bruising of the ocular conjunctiva and the lids. The site of the fissure may usually be determined by the direction of the force causing the injuries, and by finding a circumscribed area of tenderness in cases where there are no signs of damage to the orbital contents.

Fractures at the Apex of the Orbit.—Fracture of the bony wall of the optic canal is almost always part of a fracture of the base of the skull. The signs are sudden blindness, almost or quite complete, with a dilated fixed pupil, and no ophthalmoscopic changes. Often there are no other symptoms, though sometimes there are evidences of orbital hæmorrhage. The usual cause is a heavy blow or a fall on the head. As a rule, the first symptoms are those of concussion of the brain ; and when these have subsided, together with the hæmorrhagic swelling of the lids, the patient discovers for the first time that he is blind. About four weeks later, pallor of the disc, denoting optic atrophy due to a descending degeneration of the nerve, begins to be noticeable. Partial destruction of the optic nerve is not so common ; in such cases the effusion of blood into the narrow optic canal may at first cause complete blindness, succeeded later by a partially-reclaimed visual field corresponding to the undamaged fibres as the clot is absorbed.

The result of rupture of the internal carotid artery in the cavernous sinus, whether due to arterial disease or to implication in a fracture, is *pulsating exophthalmos*. Arterial blood, pouring into the cavernous sinus and ophthalmic vein, displaces the lids and the eyeball forcibly

forwards, and produces œdema of the ocular conjunctiva and lids with distinct pulsation. Usually there is diplopia due to muscular disturbance. The veins of the eye-grounds are markedly distended ; there is severe pain in the head, with pulsatile sounds subjectively heard and appreciable by auscultation. If the exophthalmos is considerable, keratitis may develop owing to the failure of the lids to close.

Treatment of Pulsating Exophthalmos.—Pressure by means of a bandage, an ice-bag, systematic compression of the common carotid on the same side for hours or days ; as a last resort, ligature of this artery may be practised, after compression has been applied for two to three days with a drainage-tube.

Fractures of the Middle Zone of the Orbit cause injury to the optic nerve in a limited number of cases only ; but in these oculomotor paralysis is the rule ; only fractures through the superior orbital fissure may be followed by complete ophthalmoplegia with anæsthesia of the orbital contents ; there may also be injuries of an isolated muscle or nerve-branch. The optic nerve is rarely injured in this part of its course ; any diminution of vision that results may end in complete recovery, total blindness from compression being apparently impossible in this position.

The site of **Fractures of the Anterior Part of the Orbit** may be diagnosed by the localization of pain and by the line of proptosis due to hæmorrhage (fracture of orbital roof—eyeball displaced downwards and forwards ; of the inner wall—eyeball displaced outwards and forwards ; of the orbital floor—displacement upwards and forwards).

In fractures of the orbital roof, in which ptosis results from severe injury to the levator palpebræ superioris, fracture of the trochlea and consequent trochlear paralysis are found (diplopia on looking down, the image of the injured eye being the lower ; the maximum vertical measure of the diplopia noted when the injured eye is adducted—on looking down and to the left in the case of a right trochlear palsy, down and to the right if a left palsy).

Fractures of the orbital floor and inner wall may paralyze the inferior oblique muscle which arises thence ; and in fractures with displacement of the roof of the orbit the supra-orbital nerve may be implicated, with anæsthesia of the brow. Fracture of the floor may injure the infra-orbital nerve, rendering the cheek anæsthetic ; while fracture of the inner wall may implicate the ethmoidal nerve, causing anæsthesia of the nasal mucosa.

Fracture of the lacrymal bone leads to epiphora and hæmorrhage into the lacrymal sac.

The *frontal sinuses* may be opened up by fractures of the supero-internal orbital wall, the ethmoidal cells or nasal passage by those of the internal wall, and the antrum of Highmore by fractures of the orbital floor.

In complete fractures with rupture of the periosteum, air may be driven into the orbit by sneezing, producing orbital emphysema if the fracture lie behind the origin of the tarso-orbital fascia, and orbito-

palpebral emphysema if the injury be further forward. In the former the proptosed eyeball and lids (which are otherwise normal) lie upon a bed of dough-like consistence (*Plate XIV*). Later there is slight congestion and perhaps emphysema of the ocular conjunctiva, with complete closure of the palpebral fissure and fixation of lids and eyeball by an extreme degree of emphysema (*Plate XV*). The diagnosis is confirmed by the absence of inflammatory signs, the dough-like feel, and the crackling elicited by pressure on the proptosed lids and eyeball.

Orbito-palpebral emphysema shows itself by marked swelling of the lids, and by the crackling therein.

Emphysema of the lids alone, without alteration in the position or direction of the eyeball, may occur in connection with fractures of the lacrymal or nasal bone anterior to the attachment of the lacrymo-orbital fascia in the inner circumference of the orbit (*Plates XVI, XVII*).

Abscess or phlegmon of the orbit, caused by infection from the nose, is a rare complication. In the presence of suppurative sinusitis or rhinitis, orbital inflammation or phlegmon may occur at any time.

If the dislocation of the orbital wall is considerable, there may be enduring displacement and paresis of the eyeball without direct injury of the orbital structures. The most characteristic symptom of severe orbital injury is traumatic enophthalmos.

Sometimes an injury may be followed by alternating en- and exophthalmos. With the patient quiet and the head erect, enophthalmos is present; stasis in the area drained by the jugular veins (as in Valsalva's experiment, under pressure or during stooping) changes this into a marked exophthalmos.

X-ray examination is absolutely indispensable to estimation of the position and extent of fractures. The commonest direct fracture of the orbital wall is a fracture of the malar bone. If the malar process be injured, mastication is interfered with. Extensive fractures may involve the maxillary antrum.

Prognosis in Orbital Fractures.—This varies according to the extent and intensity of the injury; special considerations are the presence or absence of direct injury to the eyeball or optic nerve, the extent of damage to the soft parts, and the existence of a compound ("open") fracture. Intracranial complications (meningeal hæmorrhage, concussion of the brain) must be looked for; and the sense of smell should be tested, the possibilities to be borne in mind being fracture of the frontal sinus and of the lamina cribrosa, causing anosmia and involving a risk of secondary meningitis or acute pneumococcal encephalitis from impaction of a fragment of bone into the brain.

With regard to the eye itself, recovery is possible in all nerve lesions due to the pressure of effused blood, but not in direct injuries to nerves. Care must always be taken to prevent drying and ulceration of the cornea from exophthalmos or failure of the lids to close.

Treatment.—In all fractures of the depths of the orbit, treatment is exclusively conservative. In extreme cases of proptosis and

emphysema, relief by evacuation of the blood, or air, as the case may be, is indicated.

In fractures of the orbital margin with dislocation, immediate operative interference must be undertaken, suturing wounds if the fracture be compound, removing splinters of bone (not forgetting the possible presence of foreign bodies deep in the orbit), and replacing the fractured parts in their proper position; this being rendered permanent when necessary by silver wire sutures of bone or periosteum, and by sterile wooden pegs. In simple fracture, pressure should be used to restore the fragments to their correct position. When the fracture is of old-standing, the eye-ball displaced, and its movements interfered with, and also in cases of malar fracture in which disfigurement and impairment of mastication make reposition urgently desirable, the dislocated fragment must be exposed, the orbital fascia detached from its marginal attachment, and replacement effected by traction with a resection hook or (in cases where firm callus has been formed) after loosening the outer ends.[1]

Moreover, in open injuries general surgical principles must obtain, always of course with due regard to any cerebral symptoms that may be present. I would lay down this rule, based on various observations in the literature as well as on my own experience, that *in every case of extensive open fracture, as well as in all cases of severe injury to the soft parts, in which contamination with soil cannot be excluded, a prophylactic dose of* 20 A. E. *tetanus antitoxin* (*Merck*) *must be given.*

II.—Injuries to the Orbital Contents, excluding the Eyeball.

The soft parts within the orbit are especially liable to punctured wounds, impaction of foreign bodies, and gunshot injuries; they must always be examined very narrowly for the presence of foreign bodies by careful probing and the application of *x*-rays; while in the case of fragments of iron, the sideroscope and the giant magnet should be employed. Sometimes on pressing upon the bulb or the lids, localized tenderness in the depths of the orbit or localized pain with certain movements of the eyeball, may serve to establish the presence of a foreign body, or impairment of function in oculo-motor, optic, or general sensory nerves. In these same cases, therefore, a careful examination of the eye-ground, and of the visual acuity and fields, is always necessary, especially in deep orbital injuries, to decide whether either the optic nerve or the eyeball is implicated; similarly, a general examination should be made (e.g., bradycardia should be noted), the condition of all the cranial nerves, and as far as possible those of the brain and cranial contents, should be determined. The auditory apparatus, the sense of smell, and general sensibility in the eye region, must especially be borne in mind. Examination of the fellow eye, with special reference to ophthalmoscopic findings and, later, to nystagmus, must not be neglected.

Much help may be given by careful testing of sensation; definite

PLATE X.

INNER WALL OF THE LEFT ORBIT

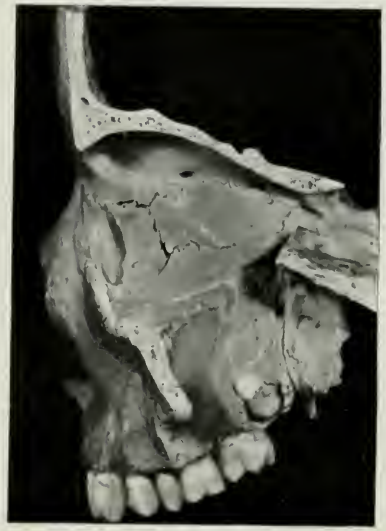


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PLATE XI.

VIEW OF RIGHT ORBIT. THE NEIGHBOURING SINUSES HAVE BEEN OPENED

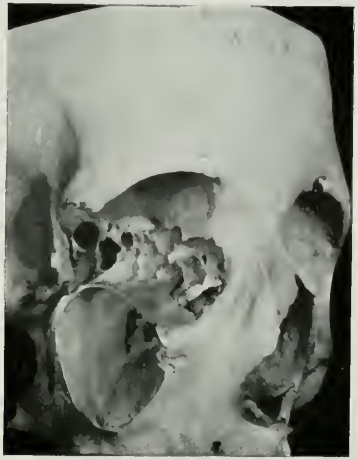

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PLATE XII.

SECTIONS OF THE ORBITS AND NOSE

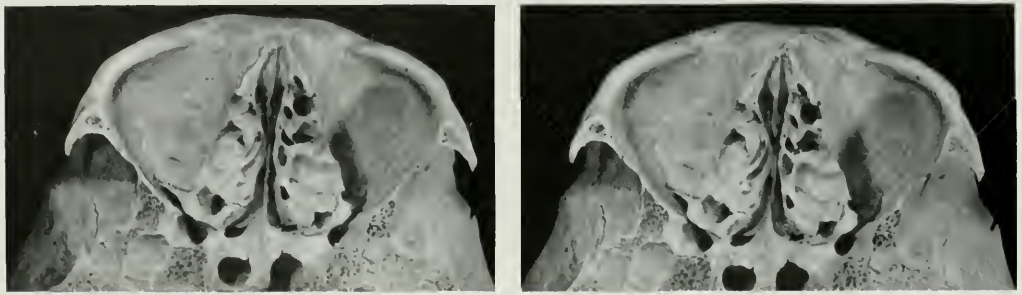

Fig. A.—Horizontal section of the orbits and nose seen from below.

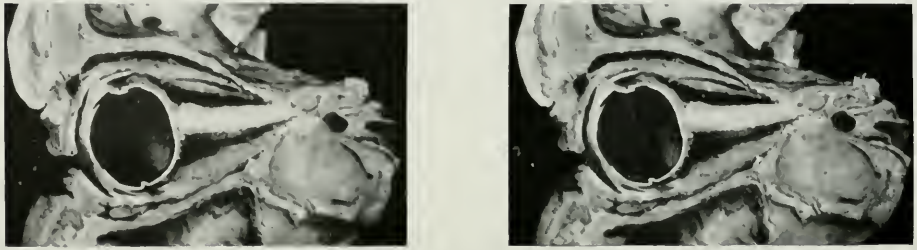

Fig. B.—Vertical section through left orbit and contents.

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PLATE XIII.

OPTIC NERVES AND EYEBALLS

Exposed by removing the roof of the orbit and the eye muscles.

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PLATE XIV.

TRAUMATIC ORBITO PALPEBRAL EMPHYSEMA

MEDICAL ANNUAL, 1912

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PLATE XV.

TRAUMATIC EMPHYSEMA OF THE RIGHT ORBIT AND OCULAR CONJUNCTIVA

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PLATE XVI.

TRAUMATIC EMPHYSEMA OF THE EYELIDS

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PLATE XVII.

BILATERAL TRAUMATIC EMPHYSEMA OF THE EYELIDS

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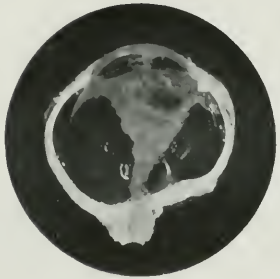
PLATE XVIII.

EYE INJURIES



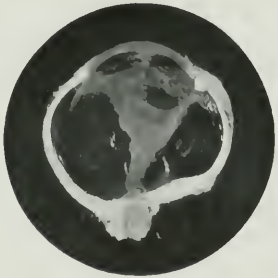


Fig. A.—Eye with splinter of iron—Iridocyclitis and total detachment of the Retina.

Fig. B—Dislocation of the lens into the anterior chamber.

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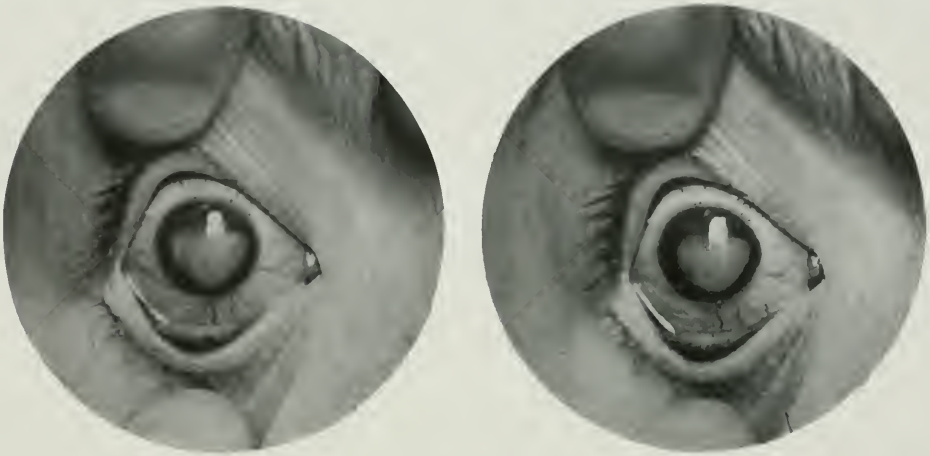
PLATE XIX.

EYE INJURIES



Traumatic subluxation of the lens (with following opacity), iridodialysis above, iridoplegia

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anæsthesia of the cornea or of the eyeball points to injury of the ciliary ganglion, if accompanied by iridoplegia and cycloplegia ; anæsthesia of the brow without complication of the inner canthus, proves injury to the supra-orbital nerve after it has given off its supratrochlear branch, etc.

Injuries with firearms call for comment under two special heads: viz., those in which the temple has been struck either in a rectangular or oblique direction. In gunshot wounds about the orbital margins, the ball may be deviated by the contour of the orbit margin. In the very common gunshot wounds of the temple of would-be suicides, the orbit, the eye, and therefore the vision, are threatened much oftener than the victim's life.

Frequently both optic nerves are shot through without any other severe abiding lesion ; in the same way, according to the direction of the shot, isolated muscular palsies may be caused. The position of the projectile, and also of bony fragments, may be determined by using *x*-rays.

When the muzzle has been directly applied to the temple, the force of explosion may drive the eyeball forward to an extreme degree. In such cases reposition is contraindicated ; the eyeball must be removed, since acute inflammatory changes are likely to develop.

If the bullet lie in the orbit or its bony walls, there is likely to be extensive comminution with impaction of bony fragments, and operative interference is indicated ; only time should be allowed for the immediate inflammatory changes to subside before this is undertaken.

In severe compression of the thorax, hæmorrhage may occur into the connective tissue of the orbit, the lids, and the eyeball (retina) itself.

Injuries of the Lids.—In all these one should bear in mind the possibility of injury to the lacrymal gland, the canaliculi, the levator palpebræ superioris, and also the deeper structures where the injury is sufficiently penetrating. It is especially important to bear in mind that foreign bodies may remain almost completely hidden in the loose cellular tissue of the orbit.

In injuries of the canaliculi, a fine fish-bone sound should be passed into the canaliculus and the skin stitched over this. This may not be possible at first: then the canaliculus should be slit up towards the conjunctival sac, and a sound introduced, to remain there and prevent premature closure. Rupture of the inner or outer palpebral ligament should be repaired by a deep stitch or by periosteal suture.

Injuries at the inner canthus, it should be remembered, endanger the lacrymal sac. If this be opened up through a wound of the skin, very special care is needed in securing accurate suture, lest a lacrymal fistula be established. If the sac be severely damaged, it is best to remove it.

If the levator palpebræ be torn (ptosis), it must be sought for and united by deep sutures after widening the wound and stitching

the tarso-orbital fascia and skin in separate stages. If the lacrymal gland be dislocated but not severely crushed, or definitely threatened by infection, it should be replaced and fixed by suture in stages (the first being of the tarso-orbital fascia). Exact union of the wound is always necessary to prevent the formation of a lacrymal fistula.

When the tarsus is extensively torn, it must be drawn up with one or the other of the skin sutures, so as to prevent the development of entropion and trichiasis. If the lid is pierced completely, the conjunctiva must first be stitched, especially if the opposed portion of the ocular conjunctiva be injured, to prevent the formation of a symblepharon. Every wound of the lid margins must be sewn up with extreme accuracy ; first a deep stitch should be passed through skin and tarsus (missing the conjunctiva), about 3 mm. from the lid margin) ; or if the tear be extensive, a deep suture to relieve tension may be passed as far as the subconjunctival tissue by means of a "doubly needled thread," the wound in the skin and margin of the lid being closed with fine silk sutures. In all cases of severe laceration of a lid a binoculus is to be worn for at least forty-eight hours. Complete rest must be secured for both eye and lid.

Special attention must also be directed to the rupture of ocular muscles, open suture being indicated under all circumstances. Any cutaneous wound in the region of the orbit may be followed by infective thrombo-phlebitis and orbital cellulitis. Early incision is urgently indicated in every case.

Injuries to the Conjunctiva.

1. *Corrosions, Burns, Scalds.*—All corrosive injuries must be treated at the earliest possible moment by thorough removal of the injurious substance : if an acid, by the use of alkaline solutions, or of milk in all cases ; if an alkali, by the introduction of oil to promote saponification ; splashes of lime may be treated by copious effusions of water.

When damage has been done to portions of palpebral and ocular conjunctiva in apposition with each other, the best means of preventing the formation of symblepharon is by repeated breaking down of the adhesions. Extensive corrosions are, however, almost sure to be followed by symblepharon, which must be treated by operation when healing is complete.

Milky opacities of the cornea following corrosions or burns, are evidence of a deep-seated corneal injury, even in the absence of any demonstrable loss of surface : with the exception of burns, in which the epithelium may be quite white without any deeper damage occurring. The extent of the epithelial injury may be demonstrated by instillation of a 2 per cent solution of potassium fluorescin, which stains the denuded area deep green.

When the ocular and palpebral conjunctiva and the cornea are extensively injured, total symblepharon nearly always follows ; the lids adhere to the cornea, the eyeball is fixed by cicatricial tissue, sometimes even the ocular conjunctiva and muscles are fixed by the action of corrosives. In deep-seated lesions of the cornea and sclerotic,

removal of the eschar is readily followed by perforation and prolapse of the iris, ciliary body, and choroid. Any corrosion or burn of the cornea going deeper than the epithelium is followed by scarring, which may gravely interfere with and even destroy the power of vision. For corrosions, the best way to relieve pain, besides unguents and cocaine, is the application of cold compresses ; for burns, heat should be applied in the form of hot, moist cataplasms.

2. *Incised, Punctured, and Contused Wounds.*—In all injuries of the conjunctiva and its folds, the following points should be borne in mind : the possible presence of a foreign body ; injury to the levator palpebræ superioris, causing total or partial ptosis ; the possibility of implication of ocular muscles and sclerotic in all cases of injury to the bulbar conjunctiva. A large hæmatoma beneath the conjunctiva should always awaken suspicion of a subjacent rupture of the sclerotic.

All conjunctival wounds must be sutured, also every solution of continuity in ocular muscles and in the sclerotic. If infection be suspected, a moist compress of 1–5000 oxycyanide lotion may be applied for twenty-four hours prior to suture. Bruised portions of conjunctiva should be removed, apposition of the cut edges being secured without tension by freeing the neighbouring parts from their attachments.

III.—Injuries to the Eyeball.

A. Direct Injury of the Cornea, Sclerotic, and Iris.

1. *Erosion of the Cornea.*—The *symptoms* are severe pain, photophobia, lacrymation. Instillation of 2 per cent potassium fluorescin stains the epithelial defect green and makes it easily recognizable. An erosion is distinguished from deeper lesions of the cornea (herpes, ulcer) by the absence of muddiness beneath a loss of substance, as well as by its shallowness.

Treatment.—The conjunctival sac should be washed out with oxycyanate of mercury lotion 1–5000, or asterol 1–2000. Once or twice daily an ointment containing orthoform 10 per cent, or xeroform 2 per cent, should be applied, till the irritative phenomena have disappeared. The erosion will be practically healed in two to five days. When purulent dacryocystitis is present, or pneumococci are found in the conjunctiva (and in suspicious cases these organisms should always be looked for), the conjunctival sac must be washed out many times daily, the lacrymal sac also being syringed with an Anel's syringe, or extirpated. If there is the smallest suspicion of infection in a case of erosion, the treatment indicated in every case (if possible after identification of the infective agent, but even without this) is cauterization of the erosion.

Recurrent Erosion. — In many cases epithelial regeneration is incomplete. Sometimes, after apparent healing, the incompletely regenerated epithelium at the site of the erosion sticks to the lids at night. When the eye is opened it is stripped off, and all the phenomena

of a new erosion are displayed. This imperfect repair may be discerned by careful use of a corneal loupe (+ 20 D), which will reveal the presence of irregular, drop-like opacities in the eroded area, and defective sensibility (as tested with a wisp of twisted cotton-wool) in the same area.

Treatment.—Recurrent erosion must be treated, after removal of the subjective evidences of irritation, by the introduction of some kind of ointment (2 per cent borovaseline, lanolin) into the conjunctival sac, or ·01 per cent of paraff. liq. just at bedtime, to prevent the adhesion of the epithelium during sleep. If, in spite of this, normal repair does not follow in a short time, as evidenced by complete recovery of vision and of sensibility in the injured spot, healing may be brought about by intensive massage ; in a few cases, however, the cornea must be curetted.

2. All *foreign bodies in the cornea* should be removed without delay : if superficial, after instillation of a few drops of a 2 per cent solution of cocaine, holocain, or novocain with a cotton-swab ; if deeper, with the spud ; large iron splinters must be removed with the magnet after incision, if the depth of fixation into the tissue makes this necessary. In every case it is important to see whether, beside the foreign body in the cornea, there is another in the eye.

3. *Wounds of the Cornea, Sclerotic, Iris, and Lens.*—The chief points to decide are : (i) Is there a complete perforation or not ? (ii) Is the wound infected, or is there special danger of infection ? If so, make a bacteriological examination, cauterize deeply and treat as for ulcus serpens. (iii) The most important : Can the presence or absence of a foreign body in the eye be determined ? This is established partly by the history, but even more by a very careful ophthalmoscopic examination of the internal eye, and a thorough enquiry into the visual functions (acuity and fields), finally by using a transilluminator, the sideroscope, and radiography.

(*a*). *Non-perforating wounds* should be treated by operation only when they gape widely or are so flapped that pressure with a spatula fails to fix the edges in correct apposition. This brings us to consider (i) *Direct suture.* The proper procedure (as in perforating wounds) is first to attempt closure of the wound ; if it extends into the scleral conjunctiva, by a stitch through the limbus ; direct suture of the cornea should only be undertaken when this fails. Both scleral and corneal suture should be practised with the finest " conjunctival " silk, in such a way that only the outer half or two-thirds of the thickness of the membrane is included in the stitch, so that the silk thread does not enter the interior of the eye. (ii) If there is not much gaping, and especially if evidences of infection are present, it is always best to cover the corneal wound with a flap of conjunctiva after Kuhnt's method. This method is also generally preferable to direct suture in the presence of flap wounds. The first step in all lacerated and contused wounds is the cautious removal of the most severely damaged portions of corneal tissue. A binoculus is

to be worn for two or three days, and atropine to be used if iritis becomes manifest.

In all non-perforating wounds suture of the conjunctiva is usually enough ; open suture of sclerotic or cornea being indicated only in ragged wounds.

(*b*). *Perforating Wounds.*—The procedure here depends on (i) The condition of the inner ophthalmic membranes ; (ii) The functional capacity of the eye ; (iii) The possibility that a foreign body, not of iron, is in the eye.

In all minor injuries affecting the cornea, either by itself or with the lens and iris, in which the visual powers are unaffected except by opacity of the media caused by the injury, the treatment indicated is immediate closure of the wound, to prevent infection and implication of the uveal tract in the scar.

Clean wounds of the cornea should only be treated by direct suture if widely gaping, and if further prolapse of the iris threatens after excision of that which has already protruded ; or if displacement and prolapse of the lens is to be apprehended, and also if primary union of the wound seems unlikely. Wounds lying centrally or close to the margin should be covered with a conjunctival flap. Frequently it is good practice to attempt closure of extensive wounds by application of a suture at the scleral margin. It is often wisest to avoid placing a stitch in the middle of the cornea, and in such cases closure with a conjunctival flap should be undertaken. For corneo-scleral wounds, scleral suture, i.e., one stitch through the limbus, will usually suffice. Otherwise the treatment should be as for wounds of the cornea.

The risks attendant on inclusion of the iris in the corneal scar are, as is well known, heightened tension, especially in elderly persons, staphyloma, delay in the healing of the wound with formation of a fistula, and secondary infection of the scar (the so-called "Wandernarbe" of Wagenmann). *The aim in treatment of all perforating wounds is, therefore, healing by first intention without inclusion of the iris.* Prolapse of the uveal tract through fresh wounds, whether of cornea or sclerotic, should be treated by excision, and the wound closed either by direct suture or, in the case of the cornea, by covering the lesion with a conjunctival flap. Prolapse of the lens capsule calls for similar treatment. If the eyeball is badly damaged by the injury, especially in respect of perception of light and projection, primary enucleation or exenteration of the eyeball is indicated.

4. *Foreign Bodies in the Eye.*—The conservative treatment outlined above is only indicated when the foreign body can be removed, and this should be undertaken as quickly as possible. In every case in which it may be an iron splinter that has to be dealt with, its discovery by means of the sideroscope (if of iron), and by the Röntgen rays if of any metal, must be undertaken forthwith ; and if of iron it should be removed with the magnet. Delay of an hour may seal the fate of the eye.

Plate XVIII, Fig. A, shows an eye, in which a splinter of iron, which

could certainly have been removed at the outset with the magnet without any risk, was allowed to remain; the consequence being a progressive iridocyclitis with total detachment of the retina.

If the foreign body cannot be removed, evisceration of the eyeball should always be considered when the inflammatory phenomena have subsided. This plan is to be followed generally in cases in which signs of inflammation of the interior of the eye are present, with rapid failure of a hitherto effective vision, the light perception and fields being defective.

After-treatment.—Instillation of atropine is only to be practised in cases of perforating injury implicating the uveal tract. At the same time the conjunctiva and the wound should be thoroughly bathed with mercuric oxycyanate 1–5000 solution; while, later on, in corneal injuries which have not been covered with conjunctiva, ointment containing xeroform 2 per cent, or orthoform 10 per cent, may be used. A binoculus should be worn for at least twenty-four hours.

When the capsule of the lens has been injured, swelling of the lens, with a consequent limited rise of ocular tension, is to be specially looked for, and the lens delivered at an early date.

B. **Injuries to the Eyeball by Blunt Force.**

Injuries to the Anterior Segment of the Eye.—(1). *In the region of the anterior chamber.* Extravasation of blood into the anterior chamber (hyphæma) is, according to Czermak, most often a consequence of rupture of Schlemm's canal; a clot is usually formed, after absorption of the effused fluids of the blood, at that part of the recess of the anterior chamber at which Schlemm's canal is burst. Anomalies of the iris and pupil are evidence of injury to the iris and ciliary body, while an abnormally deep anterior chamber proves damage to the ciliary body with dislocation of the lens.

(2). *Traumatic Iridoplegia.*—The pupil is wide, round, completely immobile in spite of stimulation by direct light, consensually, or by convergence, or reacting but sluggishly, and there is concomitant paralysis of accommodation (cycloplegia). The signs of laceration of the iris are hæmorrhage and visible tears of the iris.

(3). *Iridodialysis* is usually associated with injury to the anterior chamber. In the early stages the laceration is often covered by a clot, which after absorption appears as a black cleft, but red when lighted up by the ophthalmoscope. Radial tears of the iris are much less common; the pupillary portion is usually affected, and they rarely extend to the ciliary margin.

Treatment.—The eye must be given rest, abstinence from excitement enjoined, and a protective bandage used; an ice-bag should be applied immediately after the injury. Only when there are large clots, which defy absorption, should hot applications or paracentesis of the anterior chamber be applied. Atropine is to be reserved for cases where absorption is delayed and there is general formation of synechiæ.

(4). *Injuries to the Lens by Blunt Force.*—(*a*). *Traumatic Cataract.*—Minor injuries, even complete perforation of the lens by small foreign

bodies, may subside and leave nothing to interfere with the translucency of the lens, apart from a small opacity at the site of perforation (in the anterior capsule, due to epithelial proliferation and formation of a scar). As a general rule, however, traumatic cataract follows perforation of the capsule. Indirect injury may lead to complete cataract without visible damage to the lens capsule, either by rupture of the zonule of Zinn, with partial dislocation of the lens, in which the loss of sight is usually delayed, or immediately after the injury, apparently through rupture of the lens at the equator. In all traumatic opacities of the lens the intraocular tension must be carefully watched, since it is likely to rise, and iritis may develop; if this latter complication threatens, extraction of the lens is indicated forthwith.

(*b*). *Dislocation of the Lens* may occur by itself or in association with any traumatic lesion of the iris, ciliary body, or sclerotic. The signs of *dislocation in the capsule into the anterior chamber* are a deep anterior chamber, the pupil wide and reacting slightly or not at all; with artificial illumination the shining edge of the lens may be seen, near the corneal margin. (*Plate XVIII, Fig. B*). In such cases the lens must be removed without delay. In *subluxation of the lens* the depth of the anterior chamber is irregular, the iris and lens are tremulous, and through the widened pupil the edge of the lens may be rendered visible by the reflected light of the ophthalmoscope as a black, arc-shaped line across the pupil (*Plate XIX*).

Total Displacement of the Lens into the Vitreous.—The anterior chamber is deep, the iris tremulous, the pupil deep black, but giving the red reflex; on careful examination, the lens, if transparent, is discoverable on illumination by its black shining edge; if opaque, as a lens-shaped body lying deep in the vitreous, either partly fixed to the zonule, or free as a result of total tearing of the zonule.

In both cases, either a rise of tension or a progressive irido-cyclitis is almost sure to follow. Usually, and also in partial dislocation of the lens, cataract develops after a month or so. Under such circumstances extraction is indicated. The best operation for the secondary glaucoma that may follow dislocation of the lens is cyclodialysis (Heine).

Subconjunctival Dislocation of Lens. (*See below, Rupture of Sclerotic.*)

(5). *Traumatic Rupture of the Sclerotic.*—The application of powerful blunt force (violent impact or large size of foreign bodies, e.g., a cow's horn) may determine rupture of the sclerotic, usually also of the subjacent ciliary body, rarely of the overlying conjunctiva, at a point opposite to that of the impact of the blow, in the circumcorneal zone, typically about 4 mm. from the corneal margin, i.e., corresponding to the point where the anterior ciliary vessels perforate. According to the degree of violence used, the dialysis of the iris and the dislocation of the lens may be partial or complete; the margin of the lens may be fixed in the scleral wound (hernia lentis, phakocele), or the lens and the iris, or one of them, may be completely displaced to a subcon-

junctival position. The bulbar conjunctiva is then pushed forwards at the point of rupture by the subjacent lens, the conjunctiva itself remaining intact.

Extensive injuries lead nearly always to a gradually progressive phthisis bulbi, usually under the guise of a chronic iridocyclitis, sometimes of secondary glaucoma ; frequently this is followed weeks later by sympathetic inflammation of the other eye, even in the absence of conjunctival lesions.

If visual acuity and projection are still normal, the treatment described above for perforating wounds of the sclerotic should be followed. If both are injured, with damage to the inner ophthalmic membranes by hæmorrhage, it is best to enucleate or exenterate the eyeball without delay.

(6). *Vitreous.*—This is always injured secondarily only, usually by hæmorrhage from the neighbouring structures. Occasionally blunt force may cause a diminution in the volume of the vitreous, without producing any other lesion of the eyeball. In such cases the lens, itself unchanged, falls back, the anterior chamber is deepened, accommodation is permanently impaired, lens and iris are tremulous, and intraocular tension is lowered. The eye may remain in this condition, or cataract may develop.

Injuries to the Posterior segment of the Eyeball are only discoverable by careful ophthalmoscopy, and their diagnosis lies outside the limits of this brief review.

IV.—Injuries of the Visual Tract and Centres within the Cranium.

Injury of one optic tract has been recorded in only a very few instances. In one such case, observed in my clinic, a sabre point entered the right orbit, passed through the superior orbital fissure, was driven into the base of the skull, and severed the right optic tract. A report was published by Prof. Margulies. Other injuries to the tract are occasionally recorded as resulting from gunshot wounds of the brain. Injuries of the visual centre, like those of the tract, produce failure in the opposite half of the visual fields (homonymous hemianopia) ; thus injuries to the right tract and centre are associated with left homonymous hemianopia, and vice versa. We have up till now no sure means of distinguishing hemianopia due to lesion of the tract from the cortical form. The hemianopic pupil reaction is unreliable. Injuries of the visual centre (the region of the calcarine fissure in the occipital lobe) result from depressed fractures, hæmorrhage, gunshot wounds, and contusions, especially of the occiput, rarely from *contrecoup*.

Unilateral lesions of the visual centre produce a homonymous hemianopia of the opposite side ; bilateral lesions always cause blindness at first, often replaced later by the development of a small, central visual field. Sometimes the hemianopia may completely disappear. Occasionally, following partial injuries of the visual cortex, a homonymous sector defect or scotoma may appear in both visual fields.

If, simultaneously with hemianopia there is hemiparesis and hemianæsthesia, then we are apparently concerned, not with an injury to the visual centre, but with a deep-seated lesion of the visual tract in the white matter of the occipital lobe, i.e., in the neighbourhood of the internal capsule, the posterior extremity of which consists of the visual fibres.

The motor apparatus of the eye is relatively often involved in direct or indirect fractures of the cranial base, usually by reason of immediate injury to the motor nerves of the eye. One of the commonest symptoms of fractured bone is an abducens palsy. Localization of the point of injury to these nerves is only rendered possible by symptoms referable to similar lesions of the other cranial nerves, and later by hæmorrhage from the nose, ear, etc. The absence of signs of injury to the orbit facilitates distinction of basilar from orbital lesions of the oculomotor nerves. A general lesion of the oculomotor nuclei (floor of Sylvian aqueduct—oculomotor and trochlear nuclei ; floor of fourth ventricle —abducens nuclei) cannot be clearly distinguished from injuries to the nerves themselves. Simultaneously occurring interference with vision in both eyes, however, places the lesion in the pons or anterior corpora quadrigemina. Since there is no definite knowledge of a cortical centre for the ocular muscles in man, it is not possible to attribute a traumatic ophthalmoplegia to a lesion of the cortex. Labyrinthine injuries produce nystagmus or extreme deviation of the eyes, with subjective vertigo (Ménière).

I might further remark that traumatic hæmorrhage into the third ventricle or Sylvian aqueduct sometimes produces *dissociation of the ocular movement* ; the patient moves his eyes irregularly in the various directions.

Conjugate deviation is quite common in lesions of the hemispheres ; the eyes, usually the head also, are turned towards the lesion. Lesions of the brain-stem may also be associated with conjugate deviation ; in this instance the eyes are turned away from the lesion.

Finally, any injury of the brain or cranial contents, with the optic tract primarily unhurt, may lead to " choked disc " (optic neuritis) by way of meningitis, and in this way damage the power of vision considerably. On this account, optic neuritis developing soon after a head injury is an ominous symptom. Hæmorrhage alone, without inflammatory complication, may raise intracranial pressure to such a pitch as to produce a trifling hyperæmia of the discs ; but only very rarely does it provoke neuritis, probably by the action of cytotoxins derived from the breaking down of the clot.

Reference.—[1]*Beitr. f. klin. Chir.* lxvii. 73.

EYE, MUSCLES OF. (*See* Ocular Muscles.)

EYE, THERAPEUTICS OF. *A. Hugh Thompson, M.D.*

Tuberculin. — It is now established that many cases of sclerokeratitis, interstitial keratitis, and iritis are tuberculous, and we hear of an increasing number in which treatment by tuberculin has been

more or less successful. The following two cases reported by de Schweinitz[1] are typical: A girl of eighteen had suffered from recurrent attacks of inflammation in the right eye since the age of ten without any marked affection of the general health. The most recent attack was associated with severe supra-orbital pain. On examination, the vision of the affected eye was found to be reduced to counting fingers. The cornea showed patchy infiltration, with a moderate ingrowth of vessels. The entire sclera exhibited deep bluish-red or violaceous injection, and the episcleral tissue was tumid and œdematous, so that it presented a somewhat gelatinous appearance, and throughout it were numerous pinhead-sized yellowish nodules. There was also evidence of old iritis. The left eye was entirely unaffected. A general examination showed no evidence of tuberculous or other disease; a microscopic examination of several of the small episcleral nodules showed epithelioid and giant cells, but no tubercle bacilli. The von Pirquet test was actively positive, and a subcutaneous injection of old tuberculin produced a slight reaction, both general and local. A course of tuberculin injections was therefore undertaken, the preparation used being one of old tuberculin put up in vials containing five serial dilutions. Each two minims of No. 1 contains $\frac{1}{1000}$ mgram of tuberculin; each two minims of No. 2 contains $\frac{1}{100}$ mgram; of No. 3 $\frac{1}{10}$ mgram; and so on. The dose of each dilution is 2 min. progressively increased by 2 min. until 20 are injected, after which the next series is begun. The injections in this case were given daily for ten days, then every other day for nearly two weeks, and after that from time to time for six weeks longer. During the whole period there was an entire absence of febrile reaction, save once in the latter part of the treatment, when for twenty-four hours there was a slight rise of temperature and some conjunctival flushing. The only other treatment was boric acid irrigation and scopolamine sufficient to maintain mydriasis. Marked improvement followed, even in the first week, and by the end of two and a half months the eye was not only quiet, but vision had risen from counting fingers at 30 cms. to $\frac{6}{60}$. A second similar case of sclero-keratitis confined to one eye, in which the subcutaneous tuberculin test gave an undoubtedly positive reaction, was similarly treated, the dose of tuberculin used being gradually increased until 2 mgram was employed. In this case, even when comparatively small doses were used, the injections were always followed by considerable bodily discomfort and reaction, as well as by moderate increase of local congestion. The result was a considerable improvement in the condition of the eye, which, however, was only temporary. These two cases taken together seem to point the moral that the initial dose should be small, and that it should only be increased to that amount which the patient will bear without signs of reaction either local or general.

Atoxyl. — An analysis of the cases of optic atrophy which have followed the use of this drug has been published by Birch-Hirschfeld and Köster.[2] Of thirty-one cases, the youngest was four years, the

eldest sixty-five. The ratio of males to females was 3 to 1. The smallest dose of the poison that had been given was 2·5 grams in three months, the largest 23 grams in four months. Individual doses varied from 0·4 to 1·0 gram. The impairment of sight sets in suddenly after a small dose within a space of weeks or months, and progresses rapidly in spite of stopping the drug or any internal treatment. It is characteristic that the ophthalmoscopic signs lag behind the damage to the sight, so that the difficulty of diagnosis in the early stage is extreme. The fields are contracted as in quinine amblyopia, but the pupil reactions show considerable variation, being normal in some cases and absent in others. The authors were able to examine one case pathologically, and their conclusion is that it is a primary nerve degeneration, the changes in the glia and septa being secondary.

Salvarsan.—The reports relating to the use of the new drug in ocular disease have been summarized by Cordo.[3]

Syphilitic Iritis.—In many cases the cure of this condition has been unusually rapid after the injection of a dose of "606"; but failures have also been reported.

Interstitial Keratitis.—Most of the reports received are unfavourable, though some apparently definite successes have been obtained.

Optic Neuritis.—The successes are numerous and noteworthy. Wechselmann saw a case of optic neuritis, uninfluenced by mercury, after two months' duration, cured by injection of salvarsan with return to normal vision. Failures are reported by Fordyce and Favento.

In syphilitic affections of the *retina* and *choroid* and of the *ocular muscles*, much the same story is told, favourable reports predominating.

On the other hand, there are two considerations which it behoves all those who employ the new remedy to bear in mind. One is the *possibility of relapse* after an apparent cure from salvarsan; the other, the fact that some other arsenical compounds recently employed in the treatment of syphilis have been proved to be extremely liable to produce *optic atrophy*, and although this cannot be said of salvarsan, the drug is hardly as yet out of the experimental stage. The only actual cases of optic atrophy after the use of salvarsan as yet reported are one (Finger's) in which the patient had already been subjected to courses of treatment by arsacetin and eresol, both of them arsenical compounds, probably themselves toxic; and another in which the patient was tabetic (Starr[4]), which, therefore, can hardly be counted. To quote MacDonagh:[5] "Tabetics with optic atrophy should not be treated. If atrophy is going to supervene, '606' will not stop it, and it is by no means certain that it will not hasten it."

Several cases have been reported in which iritis, optic neuritis, choroiditis, and paralysis of the ocular muscles have relapsed after an apparent cure by salvarsan; many of these cases yielded to mercurial treatment, and some of them to further injections of salvarsan. These relapses are not sufficient to condemn the new remedy; they only show that it has not the well-nigh magical properties that were at first claimed for it. The new remedy has, it would appear, come to stay.

while the field for its employment in ophthalmology will probably never be wide. (*See also* SALVARSAN.)

REFERENCES.—[1]*Ther. Gaz.* 1910, 685; [2]*v. Graefe's Arch. f. Ophth.* lxxvi. 3, in *Ophth. Rev.* 1911, 202; [3]*Zeits. f. Augenheilk.* 1911, Jan. in *Ophth. Rev.* 1911, 134; [4]*Med. Rec.* 1911, Jan. 14; [5]*Brit. Med. Jour.* 1911, Sept. 23.

FÆCES. *O. C. Gruner, M.D.*

Search for Parasites.—Taylor[1] gives the following directions:—

(1) To a teaspoonful of fæces add 1½ oz. of water or saline solution, in a conical glass. Break up the fæces thoroughly and allow to stand until the solid matter settles. Pipette off the supernatant fluid, add more saline solution, and again mix and allow to settle. Repeat this a third time. A centrifuge may be used to hurry sedimentation.

(2) With a pipette pick up some of the solid matter from the lowest layer of the deposit, and make several moderately thick smears on slides.

(3) Dry and fix the smears by heat.

(4) Stain for 15 seconds with the following solution: orange G., 4 grams; 4 per cent solution of acetic acid, 100 c.c.

(5) Wash in water.

(6) Dry thoroughly by heat. The slide may now be examined under the oil immersion. (*See also* HELMINTHOLOGY.)

Test for Occult Blood.—White[2] recommends a modification of the original *benzidin test.* A small piece of the material is boiled in a test tube in 4 c.c. of water. This destroys oxidizing ferments. In another tube place a knife-tip of benzidin and 2 c.c. of glacial acetic acid. It is shaken till dissolved and then added to 3 c.c. of commercial hydrogen peroxide in another test tube. Finally, two or three drops of boiled fæces (the first test tube) are added to the contents of the third tube, as for doing a ring test. A blue or green colour means a positive result.

PRECAUTIONS.—The glassware must be very clean. The food must not have contained meat, fish, or other juices, nor must hæmoglobin preparations, iodides, or salts of iron have been given. The same test is applicable to stomach contents.

RESULTS.—Meat diet always gives a positive result. Chronic ulcers and cancers give positive results always, unless there has been partial healing of the ulcer. Cases of cirrhosis of the liver may mislead.

Phenolphthalein Test.—One or two grams of phenolphthalein and 25 grams of potash are placed in 100 c.c. of water. Ten grams of powdered zinc are added (Boas' modification of Meyer's reagent), and the mixture is boiled gently until colourless. Two c.c. of boiled and *cooled* material are added to 1 c.c. of reagent. A few drops of hydrogen peroxide are added, when a prompt red or pink colour means a positive result. The indications are exactly the same as in the preceding test.

White decides in favour of benzidin. He points out that the results of these tests must always be considered *with* the clinical signs and symptoms, because, to quote an example, an early cancer may not be ulcerating. The investigator must beware of the errors introduced

by piles and other purely rectal diseases. Goldschmidt[3] speaks favourably of the phenolphthalein test, regarding it as not only handy but accurate.

Tubercle Bacilli in Fæces.—Cecconi[4] recommends the *antiformin* method (*see* SPUTUM), but he adds a few c.c. of ligroin to the antiformin mixture, shaking till an emulsion is produced. The mixture is allowed to stand till a sharp line separates between the ligroin and the fæces-antiformin mixture. With a platinum needle, several loopfuls of material are picked up from just below the ligroin, and examined in the usual way.

REFERENCES.—[1]*Ind. Med. Gaz.* 1911, Ap; [2]*Boston Med. & Surg. Jour.* 1911, i, 876; [3]*Deut. Med. Woch.* 1911, 1347; [4]*Gaz. deg. Osped.* 1911, 994.

FALLOPIAN TUBES, DISEASES OF.

Victor Bonney, M.S., M.D., B.Sc., F.R.C.S.

Congenital Absence.—Spencer[1] and Chill[2] have reported two cases in which there was an absence both of the Fallopian tubes and of menstruation, but in which monthly attacks of peritonitis took place. In both cases a curious anomaly was present. The tubes were represented by small imperforate stumps, while each ovary was enclosed in a pouch formed by peritoneal adhesions.

SYMPTOMS.—These were almost identical in both, viz., recurring attacks of severe pelvic pain with vomiting. Neither had ever menstruated. On vaginal examination a tender swelling could be felt on each side. Spencer performed a novel operation in each case. The uterus was transversely incised through its fundus, and a drainage tube was passed down the uterine cavity to the vagina. The ovaries and their pouches being pulled up, the edges of the latter were sutured so as to bring them into continuity with the uterine cavity and exclude them from the peritoneal cavity. Both patients recovered satisfactorily and have completely lost their recurring attacks of peritonitis, which are attributed by Spencer to the rupturing of ovarian follicles into the peritoneal cavity. This is, of course, a normal event, but why in these two cases it should have been followed by peritonitis is not clear.

Oophorectomy and Hysterectomy.—Munro Kerr[3] emphasizes the desirability of removing the uterus in certain conditions of the adnexa. In regard to *malignant disease of the ovary*, he points out that from 15 to 20 per cent of all ovarian tumours are found to be malignant, and that it is often difficult to be sure by inspection at the operation whether the growth is cancerous or not. Therefore, in all suspicious cases, and in every one in which both ovaries have to be removed, he has practised removal of the uterus as well.

In *pyosalpinx* he has found that in a certain proportion the uterus, if conserved, becomes the seat of abdominal pain and uneasiness, necessitating its ultimate removal. For this reason he advocates hysterectomy in addition to the removal of the distended tubes, pointing out that the uterus is of no value after the tubes have been

removed. His conclusions, as far as ovarian tumours are concerned, would be accepted by all authorities, but the habitual practice of hysterectomy in cases of pyosalpinx is not supported by all gynæcologists. In many cases it is undoubtedly the proper course, but in others equally good results at the expense of a less severe operation are obtained by simple salpingectomy, especially if the uterus be ventrofixed at the same time to prevent it becoming adherent in the bottom of the pelvis.

References.—[1]*Brit. Med. Jour.* 1911, Jan. 26; [2]*Med. Press*, 1911, May 31; [3]*Lancet*, 1911, i, 95.

FAVUS.

X-ray treatment (*page 77*). *See also* Skin Diseases, General Therapeutics.

(*Vol.* 1910, *p.* 310)—A very chronic case was cured by **Inoculations** of cultures from the fungoid growth. Good results in favus of the scalp were achieved by soaking the scalp for several minutes daily in crude **Petroleum**, after washing with soap and water, and drying.

FIBROMA MOLLUSCUM. *E. Graham Little, M.D., F.R.C.P.*

How far the fibroma molluscum of Virchow is to be regarded as identical with von Recklinghausen's disease is a matter of dispute; writers use the latter designation loosely, as in this article by Ravogli,[1] but the co-existence of four symptoms (1) pigmentation, (2) cutaneous tumours, (3) swellings of the nerves, (4) mental deficiency, are in the stricter sense required to mark von Recklinghausen's disease. Ravogli reports a case which would probably not be classified as such by the majority of English authorities. The treatment adopted was injections of **Cacodylic Acid** (10 per cent solution) every alternate day, which the author found satisfactory in a previous case. [I have had some personal experience in this disease with **Fibrolysin,** which certainly appeared to reduce the tumours in size.—E. G. L.].

Reference.—[1]*Jour. Cutan. Dis.* 1911, 71.

FIBROSITIS.

(*Vol.* 1911, *p.* 315)—In the acute stage, **Rest** with a **Saline Purge** is indicated; a hot **Vapour Bath** may be useful. **Aspirin** gr. v. 4-hourly should be given, or **Colchicum** if the patient be gouty. Useful applications are **Chloral Hydrate, Menthol, Camphor,** equal parts rubbed together to form a liquid; and later, the familiar **Aconite, Belladonna,** and **Camphor** liniment. For the later, chronic stages, the application of **Superheated Air,** followed by **Ionization** with **Lithium Iodide,** and **Massage** and **Exercises,** are recommended.

FILARIASIS. *Leonard Rogers, M.D., F.R.C.P.*

G. C. Low[1] returns to the subject of *Filaria loa,* and discusses the problem as to whether *F. diurna* are the young of that worm. He gives measurements of these embryos to show that they differ slightly from those of *F. bancrofti,* while some embryos squeezed out of the uterus of an adult *F. loa,* corresponded closely with those of *F. diurna,* which confirms his view. Notes of several cases are added, in some of which Calabar swellings were found, which he believes are produced by the local action of the adult *F. loa* in the connective tissues.

Gabrielle Breeze[2] records the occurrence of filariasis in Morocco, with notes of three cases, including a 42-lb. elephantiasis of the labium, which was successfully removed.

George B. Crow[3] notes the presence of *F. nocturna* in the blood of 13 out of 244 persons whose blood was examined at night, in the United States Naval station in the Island of Guam.

REFERENCES.—[1]*Jour. Trop. Med. and Hyg.* 1911, Jan. 2 ; [2]*Ibid.* 1910, Nov. 15 ; [3]*Jour. Amer. Med. Assoc.* 1910, Aug. 13

FLATULENCE.

(*Vol.* 1911, *p.* 318)—Boos says that each article of diet should be tested separately as to its harmful effect ; milk, eggs, and red meats are especially likely to need prohibition. The only useful drugs are aperients (among which he prefers **Castor Oil** in small doses) and **Magnesium Salicylate** gr. xv to xlv t.d.s.

FOREIGN BODIES IN THROAT. (*See* BRONCHO-ŒSOPHAGOSCOPY.)

FRACTURE OF SKULL. (*See* BRAIN.)

FRACTURES. *Priestley Leech, M.D., F.R.C.S.*

Ununited Fractures.—**Bier's treatment** has not had much literature devoted to it during the last year, but Barker[1] illustrates its use in the case of ununited fractures. Excepting the interposition of fragments of detached bone, of muscles or tendons, or stripping of periosteum, the main cause of delayed or completely arrested union of fractured bones is lack of proper circulation in the injured area. This may be due to rupture of the arteries supplying the bones, to overtight bandaging when the splints are applied, or above all to disuse. Four cases are reported in which this treatment was successful ; in one case of fractured humerus the bone had been unsuccessfully wired on two occasions. Barker found the desired effects were obtained by the use of the bandage for two hours morning and evening.

Fracture of the Patella.—Alexander,[2] of Philadelphia, reports a series of 56 cases of fracture of the patella ; of these 37 were in males and 19 in females ; the left patella is more frequently broken than the right. Forty-nine cases were transverse with the large fragment above, and six were comminuted. He thinks Murphy is right in operating a few days after the accident, as the risks of sepsis are less. He recommends silver wire as the best suture material. Out of 30 cases he followed, four refractured the patella, and of these three were sutured with absorbable material. Passive motion is begun early, and the splint is left off after the first day or two. Out of the series two cases died, both from sepsis. If sepsis occurs, the best chance of saving the patient's life lies in early opening of the joint and packing with iodoform gauze. Lockwood[3] believes in the open operation for treatment of fractured patella, and thinks silver wire is the best material for suture. Three months at least should elapse before reliance is placed on union by bone. If the patella has once been broken it is more liable to be broken again. Out of 38 patients on whom Lockwood

had operated, four broke the same knee-cap twice; in two after non-operative fibrous union, in two after an operation. Corner[4] collected 504 cases of fracture of the patella recorded at St. Thomas's Hospital. The chief points are: (*a*) Fractures in the lower half of the patella are the most frequent, being 83 per cent; (*b*) Transverse fractures are most frequent, comminuted fractures next; (*c*) Three males fracture the patella to one female; (*d*) Two underwent operation for every one who did not; (*e*) It is most frequent between the ages of 30 and 40; (*f*) The patella is the most frequently refractured bone in the body; (*g*) After operation 69 per cent of the refractures which occur are in the first year after injury; (*h*) After treatment other than operation 86 per cent of the fractures which occur are after the first year; (*j*) The percentage frequency of refractures is approximately the same after operative as after non-operative treatment; (*k*) The advantages of operation are solely in the quick and complete recovery of the function of the limb.

A valuable contribution to the subject of fractures of the patella is made by Johnson.[5] Since the introduction of the *x*-rays, the occurrence of fractures of the patella without any separation of the fragments has been demonstrated beyond cavil. Before this cases had been reported by Malgaigne, Broca, and MacEwen: they are very important from a medico-legal point of view. Since the introduction of *x*-rays cases have been reported by Vallas (one case), Wegner (three cases), Barker, and others. Johnson here reports four similar cases. It is worth while giving the condensed notes of a typical case of his: "The patient, male, 28 years old, was descending some steps, when he slipped and fell on his left knee. He got up and walked half a mile without aid. After resting half an hour, on attempting to walk he had so much pain that he had to be helped to walk a quarter of a mile to the hospital. A resident made the diagnosis of 'traumatic synovitis.'" No crepitus was obtained, no separation of the fragments could be felt, and the knee could be freely moved. The out-patient surgeon, suspecting a fracture, admitted him; there was considerable effusion into the knee, and the *x*-rays showed a transverse fracture of the patella with slight comminution. The other three cases were caused by indirect violence. In every instance the result was satisfactory, bony union being obtained, and the patients returning to their occupations within three months of the date of injury. Unless great care be taken to make the exposure to the *x*-rays in the exact line of fracture, it is quite possible for a plate to appear to show bony union where none is present. Diagnosis of these cases is not certain unless an *x*-ray be employed, and it is very important that one should be made. If the injury is treated as a simple contusion or sprain, and the patient is allowed to return to work when the swelling has subsided, separation of the fragments is likely to occur, and the fracture may easily be converted into one which will require operative treatment instead of one which would get quite well with a splint, rest, and massage. The four cases described by Johnson occurred in the practice

of the Middlesex Hospital in 13 months, in which time 20 cases of fractured patella in all were treated.

Ernst Fischer,[6] of Budapest, recommends the following method and

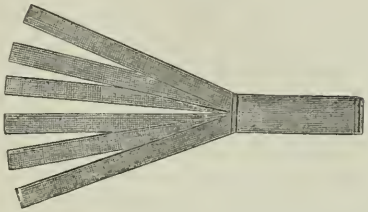

Fig. 77.—Fischer's arrangement of plaster strips.

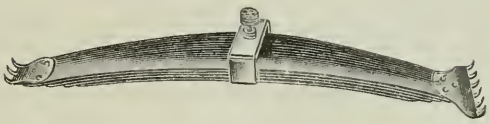

Fig. 78.—Fischer's steel springs.

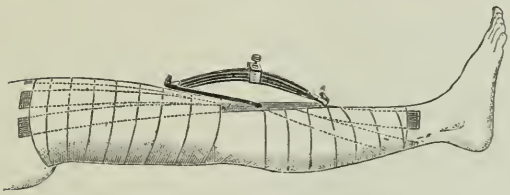

Fig. 79.—The spring applied.

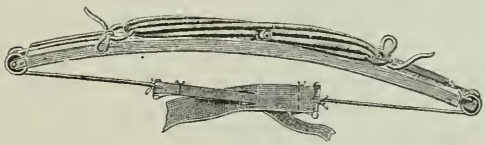

Fig. 80.—Fischer's appliance for elastic traction.

Fig. 81.—The apparatus in use.

apparatus for the treatment of fractured patella (where operation is contraindicated), for fractured olecranon, and for tear fracture of the os calcis. The treatment consists in the employment of divergent

strips of plaster (*Fig. 77*) in connection with steel springs held together by a screw clamp (*Figs. 78, 79*) (additional steel leaves can be introduced to strengthen the spring when required); at the end of the springs are hooks to which plaster can be fastened. The strips of plaster are kept in place by other strips running round the limb, and a flannel bandage is placed over the whole. A similar cheaper apparatus can be made out of a curved piece of wood, with a small iron roller placed at each end (*Figs. 80, 81*); the ends of the plaster are fastened with string to a ring, and the two rings are finally united and kept tight by means of drainage tubing. The illustrations give an adequate idea of the method of using it.

Fractures in the Neighbourhood of Joints.—R. Jones,[7] of Liverpool, read a very interesting and instructive paper before the Royal Society of Medicine on this subject. He lays great stress on a correct alignment of a fracture, particularly in the lower limb. A faulty alignment, whether there be end-to-end apposition or not, means erroneous deflection of the body weight, a cross straining of the fracture, and a stretching of certain structures in the joints which lie above and below the fractures.

Shoulder Joint.—In fracture through the anatomical neck in old people, both tuberosities are often included in the upper fragment. It is frequently impacted. The best treatment is a sling and a modest axillary pad. Gentle rubbing should be practised from the time of the accident, but no passive movement for at least two or three weeks. At the end of six weeks the patient usually recovers, with an excellent range of movement.

Fracture of the Surgical Neck of the Humerus requires more care. The head is usually rotated upwards and outwards, and if there is much displacement, a pull in the abducted direction will elicit crepitus. The ends should be manipulated under extension until a sufficient locking occurs, so that the head responds to every movement at the elbow. When this is done, the elbow should be pushed towards the shoulder, so as to compress the fractured ends; the arm should be brought down to the side, and there fixed for a few days by pad and bandage. At the end of a week it will be found that the spasm of the scapular muscles has passed off, and treatment can be continued by pad, sling, and bandage.

One of the commonest complications of fractures of the upper humerus is dislocation of the head. Manipulation should be first tried whilst the structures are relaxed, and if this fail the arm should be extended perpendicularly while the surgeon manipulates the head. In a recent case failure to reduce by manipulation should be followed by open operation to replace the loose ends. In old cases where the nerve or artery is involved, removal of the fragment is always indicated, and good results often follow.

Elbow Joint.—Fractures in the neighbourhood of this joint are very troublesome. Early passive movement, as generally practised in these fractures, is positively harmful; it disturbs the uniting

fragments of bone and leads to fresh plastic exudation with excess of callus and increased formation of connective tissue about the joint, all of which are conducive to increased stiffness. The oft-repeated to-and-fro movements only do so much daily damage. Never move an elbow until satisfied that the union is not likely to be disturbed. This is true of all joints. They should be put through their movements once, and then be left to recover from the damage. In all fractures about the elbow joint, first supinate, and then acutely flex the elbow. For some days it is left in this position, and is then placed in a sling, the wrist being kept immediately below the chin. At the end of a fortnight the wrist is dropped two or three inches, and the patient is allowed to move the wrist from its resting place back to the chin. If this can be done, the wrist can be lowered still more a few days later; if it has stiffened in its new position, it must again be slung in the acutely flexed position. At the end of three weeks passive movements may be begun. They should consist of only one movement in each direction (pronation, supination, flexion, and partial extension), and then the arm should be replaced in the sling. The only fracture which should not be thus treated is that of the olecranon.

Fracture of the Head of the Radius is usually vertical, and occurs within the orbicular ligament. Like all fractures of the upper end of the radius, there is muscular spasm on attempts at supination; usually there is no crepitus, but distinct pain on direct pressure. In such a case, if supination is obstructed, immediate exsection of the fractured piece is the best treatment; the rough edges should be trimmed, and in order to lessen callus formation, the bare cancellous tissue should be well compressed by means of a smooth steel implement. If the fracture be below the orbicular ligament, crepitus is usually obtained, and full supination is effectively secured by the close approximation of the forearm upon the arm.

Fracture of the Olecranon.—Maintain the arm in straight position, and if the line of fracture is transverse, and the fragments are well apart, fix them with screw or wire. In oblique or stellate fracture, Jones does not operate. In fractures of the ulna (upper third) below the olecranon, he has sometimes used Lane's plates.

Wrist.—In Colles' fracture he believes in the efficacy of complete reduction. In old cases of many weeks' standing, when deformity, marked disability, and sometimes pain exist, he places a Thomas' wrench on the lower end of the radius and forcibly reduces the deformity, usually without much difficulty. In fracture of the carpal scaphoid, the surgeon should flex the wrist acutely and place firm pressure on the dorsal fragment, then completely hyperextend the joint. If this effect cannot be attained, the prominent piece or even the whole bone should be excised. The excision is much more successful if performed immediately rather than later. In the old neglected case, where the power of the grasp is diminished because extension at the wrist is limited, the wrist should be fixed in hyperextension, even if the aid of the wrench be necessary.

Hip Joint.—The adolescent fracture connected with the hip is much more common than is generally appreciated, and is productive of the deformity known as traumatic coxa vara. It consists of a partial or complete separation at the epiphysis of the head, a fracture through the neck, or a fracture involving both neck and epiphysis. A typical case of separation or partial separation due to a slight strain is as follows: A boy of perhaps 12 or 14 while playing football, attempts to turn suddenly, and feels a sharp pain and a disability in his hip. He hobbles off the field, and after resting a short time, walks back to school and rests. The surgeon finds the movements fairly free in the direction of flexion, extension, and adduction; the rotations are distinctly painful, and abduction beyond a short range is not tolerated. Measurements of the limb are normal. After ten days or a fortnight of idleness, the boy is back again at school games. In days or weeks another strain occurs, with similar symptoms. Games are prohibited for the rest of the term. One day, something gives way in the hip, and he has to be helped to bed. There may be now a half or three-quarter inch shortening, and on examination a separation of the epiphysis, partial or complete, will be found. A case like this is generally diagnosed as a sprain or a synovitis. An *x*-ray shows the femoral head in position, and the femoral neck travelling upwards.

In another type the injury is severe, the disability more pronounced and lasting, and there is either a fracture of the neck or a complete separation of the head. The third type is that of a youth who slightly injures his hip and is incommoded, hardly disabled, for a day or two. As the weeks pass he complains of increasing lameness and stiffness in the hip, and the symptoms are very much those of early hip disease. There are limitation of movement in all directions, shortening of the limb, elevation of the trochanter above Nélaton's line, and an *x*-ray plate shows coxa vara of the epiphyseal type. The treatment should consist of immediate fixation, with extension and extreme abduction. By this means the sliding head or fractured neck is placed in its proper relation with the shaft. Under an anæsthetic the pelvis is fixed, while the limb is abducted, so that the upper border of the acetabulum acts as a fulcrum. The patient is then fixed in plaster (Jones prefers an abduction frame) until consolidation has occurred, probably about six weeks. A simple caliper splint should be worn for some time, so devised and fitted that no strain is allowed upon the femur while the patient walks.

In impacted fracture of the femur in old people, many surgeons hesitate to diagnose a fracture if there is no shortening. Jones is of opinion that the presence of external rotation of the limb and tenderness about the neck of the femur are sufficient to determine a diagnosis. Another important point is that in an impacted fracture the patient can often lift the limb from the bed. Where there are no rotation and little shortening, disimpaction need not be done; where there is external rotation or appreciable shortening, he disimpacts. If there is no contraindication to the recumbent position, he tries to

get apposition and immobilization, and this can only be done by fixation of the limb in adduction, with fixed rather than elastic traction. He obtains this by a modification of the double Thomas' frame. Six weeks later a Thomas' knee bed-splint is applied, and guarded passive movements are used. A fortnight later the patient walks in a caliper splint. In cases where hypostatic congestion is threatened, the patient is placed in a Thomas' knee splint with the limb adducted, and he is allowed to be propped up, if necessary, even in the sitting posture. In old fractures with limited movement and no signs of traumatic arthritis, adhesions may be safely broken down under anæsthesia, and mobility restored by massage. Split fractures of the shaft of the femur involving the trochanter may need a couple of screws, but nailing the trochanter to the neck in fractures of the aged is undesirable. Good adduction makes for correct alignment.

The Knee Joint.—Fractures of the lower end of the femur Jones treats by means of traction in the line of the limb, preferably by a Thomas' knee splint. The backward and downward rotation of the lower fragment due to contraction of the gastrocnemius, is of slight importance compared with the effect of upward traction of the quadriceps and hamstrings. When functional disability results, it is usually due to the interference with movements of the patella by the *forward* displacement of the upper fragment. If there be a condyloid separation, lateral pressure with extension is indicated. Fracture of the internal tuberosity of the tibia is very apt to result in a genu valgum, unless a perfect reduction is made. It may be caused by direct or indirect trauma. If within the first few days one is unable to secure a level intra-articular fracture line, open replacement with nail fixation should be made.

Ankle Joint.—In horizontal fracture of the astragalus, Jones is in favour of immediate removal of the bone. *Pott's Fracture.*—The material deformities in this fracture are two: the well-known outward dislocation of the foot, and a less generally recognized slight backward displacement. Complete reduction must be the first step. To reduce the deformity, first increase it to disentangle the ends; with the foot somewhat flexed, pull the heel forwards and push the tibia backwards, until the dislocation of the astragalus is mended. Then slightly overcorrect the valgus by force. Maintain the overcorrected position for three weeks. The limb should bear no weight before the fifth week. If the patient be now allowed to walk, he will return to the out-patient department with a valgoid deformity. To prevent this, the patient wears a boot with the heel crooked, so that the body weight is deflected from the inside to the outside of the tarsus. In old malunited cases, operate. If the main deformity is eversion, remove a wedge from the tibia three-fourths through the bone, and divide the fibula by an open osteotomy. Close the wounds, and in a fortnight remove the stitches, and fracture the two bones for correct alignment. In old cases of bad eversion and unreduced

displacement of the ankle, remove the astragalus and correct the lateral deviation by osteotomy and wedge.

Another injury which may be overlooked is a split fracture of the outer portion of the lower and anterior articular surface of the tibia. A triangular piece in juxtaposition to the fibula, which may only involve the anterior and external surface of the bone, is displaced slightly forwards. This occurs as a separate entity, and is often found in conjunction with Pott's fracture; sometimes in connection with fracture of the astragalus. Unless the foot is *x*-rayed, the injury is likely to be overlooked, and in neglected cases the patient is unable to flex his foot to a right angle. There is constant pain over the flexure of the ankle, increased on pressure, and the foot seems swollen over the instep. There are a widening of the lower end of the tibia and a forward projection suggesting a displacement of the foot backwards. To reduce the fracture, fully extend the foot, and while firm pressure is made upon the forward fragment, the foot should be acutely flexed. If the foot cannot be acutely flexed the tendo Achillis must be divided. In old-standing cases removal of the obstructive bone is required. If operation is refused, an addition should be made to the heel of the boot, so that the prominent tibia is not subjected to pressure. Experienced radiographers may fail to recognize this condition in old cases, for all that is seen sometimes are a thickening and a blurring of the lower margin of the front of the tibia from osteitis.

Fractures of the Head and Neck of the Radius.—These fractures were supposed to be very rare previous to the use of the *x*-rays in surgical practice. Hammond[8] reports two cases. The symptoms are deceptive. Pain is the only constant one. Crepitus may be obtained in some cases on rotating the forearm, and this is the movement which usually gives pain. Flexion and extension are less painful, but may be limited. There is usually a point of localized tenderness over the head or neck of the bone. The diagnosis is best made by means of the *x*-rays. The fracture may be a fissure one in a vertical direction through the head or neck, the fragment often being wedge-shaped; or the head may be impacted. In both types the fragment is usually in good position. There may be enough displacement to interfere with flexion as well as rotation. If the fracture occurs in the neck of the bone, the upper fragment is more likely to be displaced downward and outward, and can often be palpated; in these cases the disability is greater and the symptoms are more pronounced. Sometimes the head is split into several fragments.

Prognosis.—This is good where there is a vertical fissure through the head, and often in impacted cases. Where there are comminution and separation of the fragments, the chances of obtaining a useful elbow are less. Extrusion of bone into the joint cavity and the formation of callus may interfere with flexion and extension as well as with rotation, and the patient should be warned of this.

Treatment.—Where there is slight displacement, a right-angled splint should be applied and the arm supported by a sling. At the

end of a week these should be removed at intervals of two or three days, and massage and gentle passive movements practised. The splint may be omitted at the end of three or four weeks.

If there is marked displacement of fragments, operative treatment may be considered ; but the best results will usually be obtained by conservative treatment.

Fracture of the Tarsal Scaphoid.—McAusland and Wood[9] report cases treated by operation. It is due to violence from falls received either in forced dorsal or plantar flexion. The signs are swelling and tenderness over the bone, perhaps with displacement of one fragment. The ankle can be flexed and extended ; but when forced, movements are accompanied by pain referred to the scaphoid. They think that unless the displaced fragment can be reduced and held in position, operation will give better function. This may consist in removal of the fractured portion, or an excision of the scaphoid *in toto*, leaving as much periosteum as possible in order that regeneration of bone may take place. Abadie and Rawge[10] have an article on the same subject, where they give notes of some twenty-eight published cases. The treatment they recommend is reduction without operation ; if this is impossible, operation is indicated, with reduction or removal of the whole or a portion of the bone. For embolism occurring after fractures, see article Embolism, Cerebral Fat.

Lane on **X-ray** examination of fractures (*page* 70).

References.—[1]*Lancet* 1911, Feb. 4 ; [2]*Ann. Surg.* 1911, Ap. ; [3]*Brit. Med. Jour.* 1911, June 3 ; [4]*Ann. Surg.* 1910, Nov. ; [5]*Lancet* 1911, Jan. 21 ; [6]*Wien. klin. Woch.* 1909, Oct. 6 ; [7]*Lancet*, 1910, Nov. 19 ; [8]*Ann. Surg.* 1910 ; [9]*Ibid.* 1910, Dec. ; [10]*Rev. de Chir.* 1910, Sept.

FRAMBŒSIA. (*See* Yaws.)

FRECKLES.

(*Vol.* 1911, *p.* 578)—These may be successfully removed by the local application of **Alcohol.**

FUNGOUS INFECTIONS OF THE FINGER NAILS.

E. Graham Little, M.D., F.R.C.P.

Cranston Low[1] tabulates nineteen cases : sixteen of ringworm, two of favus, and one of an undescribed fungus infecting the finger-nail. In the first class there were fourteen females and two males. In none of these were the toe-nails involved. The infection seems to take place from the under surface of the free margin of the nail.

To *demonstrate the mycelium*, scrapings of the nail are gently heated in 6 per cent liquor potassæ for a few minutes ; or the fungus may be more easily seen in specimens soaked for some hours. To obtain cultures, pieces of the nail were scraped or clipped off and placed for two to three minutes in absolute alcohol, and broken up as small as possible ; these are then allowed to dry, and implanted on Sabouraud's proof media (4 per cent maltose, 10 per cent peptone, 1·5 per cent agar), and kept at 20° C. In five of the cases the culture obtained

was of *Trichophyton crateriforme flavum*, in two of *Trichophyton rosaceum*, and in one it was indeterminate.

TREATMENT.—The easiest method is to keep the nail covered with a rubber finger stall, after applying **Ung. Hydrarg. Ammoniat.** night and morning; this is often ineffectual, however. Walker uses **Fehling's Solution** applied on lint to the nail, covers it with a finger stall and leaves it on for a day or two, after which the nail can be removed with forceps, and the matrix is dressed continuously with **Copper Sulphate** solution 10 gr. to the ounce of water. Favus of the nail was treated in the same way.

REFERENCE.—[1]*Edin. Med. Jour.* 1911, i, 121.

FURUNCULOSIS. *E. Graham Little, M.D., F.R.C.P.*

Shingleton Smith,[1] from a painful personal experience, concludes that **Bier's Cupping** methods are greatly over-rated in the treatment of this affection; they failed completely in his hands. **Vaccine Therapy** was far more successful. For *local application*, painting with **Liq. Iodi Fort.** was the best abortive agent.

For **Ionization,** *see page* 96.

REFERENCE.—[1]*Brist. Med.-Chir. Jour.* 1911, 157.

GALL-BLADDER AND BILIARY TRACT, SURGERY OF.

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Kehr,[1] in a short article, gives a résumé of a personal experience of 1600 operations, comprising almost the entire development of the surgery of gall-stones, with a brief outline of the growth of his own methods and beliefs. His first gall-bladder case was operated upon as a supposed tumour of the stomach. He encountered a gall-bladder filled with stones and tightly adherent to the pylorus. He opened the gall-bladder, removed the stones, and sewed it up. He then split the pylorus, and divulsed and repaired it after the method of Heineke-Mikulicz, thus employing two methods which to-day are absolutely rejected. Moreover, his patient got up of her own accord to go to stool on the second day. In spite of all this, she recovered and is still living. Further, she advertised with such effect that during the year he had four cases, the next year twelve, and from that time a continued increase.

About 1890 cystendysis was a popular operation. Its disadvantages were soon apparent in the treatment of certain cases, notably empyema. Cystostomy therefore, began to displace the simpler operation. This also did not satisfy some; it did not permit inspection of the neck of the gall-bladder; stones were easily left behind, not all cases recovered with drainage, and stones formed subsequently; some gall-bladders became carcinomatous; in others adhesions to the abdominal wall gave trouble. Therefore he early (1894) began to practise **Cholecystectomy,** of which he has remained the foremost advocate, though bitterly and

increasingly assailed by many operators who can now point to as great an experience in gall-bladder surgery as himself.

The next important step was the discovery that gall-stone disease as a rule concerned not only the gall-bladder and cystic duct, but the whole biliary system, and even the pancreas. The examination of this whole area necessitated an ample incision, for which purpose Kehr has long advocated one beginning at the xiphoid process, running down in the midline, and then across the rectus muscle to the right. Often stones are found in the common duct without any sign, and at times without a history of jaundice. Thoroughness, according to Kehr, demands the removal of the gall-bladder and of all stones in the common or hepatic ducts. It was soon apparent that suture of the hepatic and common ducts was a mistake. Drainage is an essential part of the operation, not only to relieve infection, but also because it is impossible to say always that no stones have been left behind, egress for which should be provided by drainage. Kehr also employs irrigation of the ducts in his after-treatment for the purpose of dislodging stones which may have been overlooked. Even now he admits leaving stones behind in the choledochus or hepatic duct in 12 to 15 per cent of his cases, and is obliged to rely upon irrigation to dislodge them, in addition to probing and palpation of the ducts. The operation of the present, and indeed the future, is stated to be removal of the gall-bladder and cystic duct if containing stones, with opening of the common duct and drainage of either the common or the hepatic duct. This is done by means of the rubber T-tube, by which stricture is avoided.

Of 120 cases operated upon by Kehr during the past year, ten died, all but one being late and complicated cases. Among 72 uncomplicated cases there occurred but one death. The indications for operation are given as follows :—

1. The " vital " indication is found in chronic obstruction of the choledochus, in acute and chronic empyema of the gall-bladder, in perforation, and in carcinoma.

2. The relative indication is present in all cases in which continued misery or recurrent colic destroy the joy of living and cause disability (chronic cholecystitis, adhesions, etc.).

Bilio-intestinal Anastomosis.—One of the most difficult surgical problems is the establishment of a new communication between the biliary tract and the intestinal canal in cases where the choledochus, the normal outlet for the bile, cannot be used in its terminal portion. Such a condition is due most often to tumour, benign or malignant, of the head of the pancreas. Impermeable strictures of the lowermost portion of the common duct may also constitute an indication for bilio-intestinal anastomosis, and the operation has been done in cases where a stone was so lodged in the choledochus that the anastomosis above the obstruction seemed the quickest and safest remedy. At the present time the latter indication is hardly valid, since improvement of technique has made every common-duct stone accessible.

Lejars[2] has recently drawn attention to the difficulty of distinguishing

between malignant disease of the head of the pancreas, and chronic pancreatitis with occlusion of the common duct by pressure from without. This form of pancreatitis is curable by a bilio-intestinal anastomosis which will re-establish the drainage of bile into the intestine. Carcinoma of the pancreas may at times be relieved of its most distressing symptoms, jaundice and biliary cirrhosis, and life be prolonged by such an anastomosis. Kehr has on a number of occasions performed such an operation by way of palliation, and has seen life prolonged as much as two years.

Moreover, the fact that unexpected recovery has more than once taken place in cases of inflammatory thickening of the head of the pancreas, mistakenly regarded as cancer, makes the operation in such cases entirely justifiable. The method of operation is still a moot point, and often one to be decided only by the conditions found at operation. The types which have been performed are thus summarized by Doberer:[3] (1) Between gall-bladder and stomach or intestine: Cholecysto-gastrostomy, cholecysto-enterostomy. (2) Between cystic duct and stomach or intestine: Cystico-gastrostomy, cystico-enterostomy. (3) Between hepatic duct and intestine (duodenum): Hepatico-enterostomy (hepatico-duodenostomy). (4) Between choledochus and intestine: Choledocho-enterostomy. (5) Between dilated intra-hepatic ducts and intestine (stomach) in cholangitis—the so-called hepato-cholangio-enterostomy (gastrostomy).

Lejars (rightly, it seems to us) prefers cholecysto-enterostomy or cholecysto-gastrostomy to all other methods of bilio-anastomosis. When the gall-bladder is available it affords the easiest and safest route of anastomosis. The majority of the other more difficult and unusual methods of anastomosis came from Germany, where the practice of removing the gall-bladder is prevalent, chiefly owing to the influence of Kehr. In order that the gall-bladder may be available for the purpose, it is necessary, however, for the cystic duct to be patulous. Occasion may therefore arise to use one of the other methods, even with the gall-bladder *in situ*.

The danger of infection ascending to the liver is present, it is true, but clinically it does not appear to be of much moment, and certainly not to be weighed in the presence of the severe conditions which only would cause such an operation to be contemplated.

Kehr also prefers to use the gall-bladder when available, as shown by the list of such operations in the last three years reported from his clinics by Eichmeyer:[4] 12 cholecysto-gastrostomies, 1 cholecysto-duodenostomy, 2 choledocho-duodenostomies, 4 hepatico-duodenostomies, 1 hepato-cholangio-gastrostomy, 2 hepato-cholangio-cholecysto-gastrostomies. The results of the latter two types were unfortunate, and as Lejars insisted, these operations are to be regarded as last resorts.

Doberer[3] has, however, reported a temporarily favourable outcome in an operation of this sort to which he has given the name of hepato-duodenostomy. It became necessary, as the result of an operation

for relief of symptoms of obstruction of the common duct following a previous operation for the removal of stone. At the second operation dense adhesions were encountered, the duodenum was torn, and a rupture of the liver substance occurred from which bile exuded. The rent in the duodenum was therefore joined to the rent in the liver by circular suture. The patient recovered, the jaundice disappeared, and bile reappeared in the stools. At the time of the report the patient had been under observation less than two months.

From Binnie's clinic comes a report[5] of the use of the proposed fistulo-enterostomy of von Stubenrauch.[6] As Sutton remarks in making the report, most surgeons have met one or more cases of persistent post-operative biliary fistula in which the conditions known from the preceding operation argued against the success of a secondary cholecystenterostomy or choledocho-enterostomy. Numerous procedures have been proposed for the relief of this distressing condition, the most promising of which are the fistulo-enterostomy of von Stubenrauch and the choledochoplasty of Sullivan.[7] Neither of these has been tried by its author on the human subject, though both have given promising results in animal experiments.

In this case a biliary fistula persisted after cholecystostomy and choledochostomy as a result of pressure from the enlarged head of the pancreas. The procedure attempted was to place the fistulous tract in communication with the intestine through the medium of a segment of bowel. The attempt unfortunately, was a failure, and a fæcal fistula resulted, which required closure by operation.

REFERENCES.—[1]*Münch. med. Woch.* 1910, 1986; [2]*Sém. Med.* 1911, Jan. 25; [3]*Wien. klin. Woch.* 1910, 1445; [4]*Arch. f. klin. Chir.* 1910, xciii, 4, and xciv, 1; [5]*Ann. Surg.* 1910, ii, 380; [6]*Arch. f. klin. Chir.* 1906, lxxix, 1025; [7]*Jour. Amer. Med. Assoc.* 1909, i, 774.

GALL-STONES.

Urotropin thought likely to be useful in (*page* 18).

GANGRENE OF LUNG.

(*Vol.* 1911, *p.* 28)—Intramuscular injections of a solution of **Eucalyptol** and **Menthol** in oil constitute the best treatment, according to Berliner.

GASTRIC ULCER. *Robert Hutchison, M.D., F.R.C.P.*

ETIOLOGY.—Wilkie,[1] as the result of his experiments on animals, arrives at the following conclusions: (1) Thrombosis of veins of the omentum is readily produced by mechanical, thermal, and bacterial agencies. (2) From thrombosed omental veins emboli may frequently separate, probably owing to the periodic vasodilatation and contraction associated with the ingestion of food. (3) Emboli from veins in the omentum may, under certain circumstances, be carried up gastric veins and become impacted in the venous plexus of the submucous coat of the stomach, and determine a gastric ulcer. Mansell Moullin[2] points out that the normal mucous membrane of the stomach possesses an immunity to the corrosive action of the gastric juice, but that this

immunity is lost when the mucous membrane is killed or injured. Such injury may be the result of purely local causes (e.g., direct violence, such as a blow on the epigastrium), some gross vascular lesion (e.g., embolism in septic endocarditis or general septic infection), or the swallowing of corrosives. Injuries to the mucous membrane from indirect causes are, however, far commoner. Such indirect causes are septic poisoning, either general or local (e.g., from oral sepsis), exposure to cold, irritation of the mucous membrane by imperfectly chewed food, etc. All of these causes lead to a condition of hyperæmia and hypersensitiveness of the gastric mucosa, with swelling of the lymphoid follicles, and it is in one of the latter that the ulcer usually starts.

Diagnosis.—Bolton[3] considers it important to distinguish between acute and chronic ulcer.

Acute gastric ulcer is commonly often latent and gives rise to no symptoms. Otherwise it announces its presence in one of three ways : (1) By a sudden perforation ; (2) By sudden and profuse hæmorrhage ; (3) By pain and vomiting, with or without hæmorrhage. As the ulcers tend to heal quickly, the symptoms last a proportionately short time.

The usual history of a *chronic gastric ulcer* is one of long-standing indigestion, with attacks of pain, vomiting, and hæmatemesis at intervals.

Since acute ulcers tend to recur in the same individual, the recurrences are usually diagnosed as relapses of chronic gastric ulcer, but attention to the following points will settle the diagnosis in many cases. There is no *one* point of distinction, so that the whole group of symptoms must be carefully studied. The pain is not so severe as in chronic ulcer, and it is not so commonly paroxysmal and independent of food ; neither is it so liable to be continuous. Vomiting is commoner in the chronic form. Hæmatemesis in the acute disease is more liable to be profuse, to commence suddenly, and to cease suddenly. Hyperacidity occurs frequently in chronic ulcer ; in acute ulcer the few estimations which have been made indicate that the acidity is normal or diminished. Wasting is only seen in chronic ulcer. Very long intervals between the attacks are in favour of recurrences of acute ulcer. Diminishing lengths of the intervals, and finally a condition of more or less constant pain and vomiting, are characteristic of a chronic ulcer.

Absolute freedom from symptoms during the intervals is in favour of acute ulcer, and the presence of some form of indigestion in favour of chronic ulcer. Of course the symptoms of indigestion may occur from time to time in a normal person, and they often precede the symptoms of an acute ulcer, but this point is certainly of value when taken in conjunction with others. Even though absolutely free intervals occur in chronic ulcer, it will often be found that the patient is unable to eat a full diet, and only keeps well by living on milk, eggs, and fish. In intervals between acute ulcers the patient can more often take any diet with impunity.

Acute ulcer is commoner in the young, and especially in women, although no age is exempt. Finally, transitional cases occur in which the patient may or may not have had a previous attack, but the duration of the symptoms is prolonged. Such cases are instances of acute ulcer, the healing of which is delayed or which is extending.

The doubtful value of **X-rays** in diagnosis is discussed on *page* 67.

TREATMENT.—Bolton[4] draws the following conclusions as regards treatment from his observations on the healing of experimental ulcers: In the treatment of a case of ulcer of the stomach the following principles should be observed: (1) During the early stages of the healing of acute ulcer the patient should be given a food which does not stay long in the stomach and which does not excite a copious flow of gastric juice. (2) The period of treatment in bed should be at least three weeks. (3) The starvation diet of the older physicians is not necessary, because the general nutrition suffers too much, and because ulcers heal well on some such diet as the above. (4) In the case of acute ulcers which are extending, or chronic ulcers, healing cannot be expected to occur in three weeks, because the ulcer must first be got into a suitable condition for healing, and then, owing to its size and thickness, the healing must take some weeks longer to be completed, so that the treatment in bed is to be conducted like that of simple acute ulcer, but extended over a period at least twice as long. (5) Since in many cases of gastric ulcer there is hyperacidity of the gastric juice, and when the gastric juice is acting destructively, hyperacidity increases this destructive tendency, this high degree of acidity should be controlled by the administration of **Alkali.** This is not so necessary in acute ulcer as in the more chronic forms.

Essex Wynter[5] recommends **Chloretone** (10 gr. in 10 oz. of water) per rectum as a sedative in cases of recent *hæmatemesis* from gastric ulcer, and the same drug by the mouth for pain and vomiting. He has also found inhalation of **Oxygen** very useful in persistent vomiting after operation for perforated ulcer. He believes in **Extract of Belladonna** ($\frac{1}{2}$ or $\frac{1}{4}$ gr. in pill) both as a local anæsthetic and for lessening secretion and peristalsis. This drug is also strongly recommended by Schick[6] for the same purpose. He gives it in the form of atropine ($\frac{1}{2}$ to 1 mgram hypodermically once or twice a day). He finds it relieves pain, lessens gastric secretion, and favours the action of the bowels.

As regards the difficult question of *when to recommend operation* in a case of severe hæmatemesis from gastric ulcer, Bolton[4] says that we have three points to go on: (1) Profuse hæmorrhage is sometimes fatal; (2) In the particular case under consideration the bleeding has reached the danger point; (3) Many similar cases are recorded in which the bleeding point has been secured and the patient has survived. The second point is the really difficult one, namely, into what degree of danger may the patient be allowed to enter before the surgeon is called in? The question of the mortality of this operation should be put aside in the consideration, as the case is naturally desperate. If a patient vomits two or three pints of blood, and after an interval, if the

clot breaks down and a similar amount be vomited, the case should be operated upon. But it is quite common for a profuse hæmatemesis to be followed by smaller ones at intervals, or for continued melæna only to follow, so that clear indications may not exist. In doubtful cases the most important point is to be guided by the amount of the initial loss, as indicating the size of the ruptured vessel more or less accurately, the condition of the pulse, and the colour of the patient. With regard to the operation itself, there is only one thing to be done, namely, to open the stomach and secure the bleeding point in the way which commends itself best to the surgeon.

References.—[1]*Edin. Med. Jour.* 1911, May; [2]*Lancet* 1910, Oct. 1; [3]*Brit. Med. Jour.* 1910, Aug. 27; [4]*Ibid.* 1910, Dec. 24; [5]*Clin. Jour.* 1911, May 24; [6]*Wien. klin. Woch.* 1910, Aug. 25.

GASTRO-ENTERITIS.

Ascitic Fluid hypodermically in (*page* 6).

GINGIVITIS, SUPPURATIVE. *Leonard Rogers, M.D., F.R.C.P.*

P. Hehir[1] writes on ulcerated and swollen gums in the Indian Army among natives. In several cases he found an amœba resembling *A. coli*. There is often a scorbutic element present, indicating treatment with **Lime Juice** and **Vegetables.** The most useful local application is **Iodine** (tinct. or liq.) once or twice a day, and a **Chlorate of Potash** mouth wash.

Reference.—[1]*Ind. Med. Gaz.* 1911, Mar.

GLANDS OF NECK. (*See* Adenitis, Cervical.)

GLAUCOMA. *A. Hugh Thompson, M.D.*

Treatment.—Herbert's work is of primary interest in relation to the importance of the permeable cicatrix in the operative treatment. (*See also Medical Annual*, 1904, 1909, 1911.) When his latest operation[1] was first performed, a small subconjunctival sclero-corneal section was made into the anterior chamber by a very narrow Graefe knife, at the lower and outer quadrant of the eye; an incision about 2 mm. long was cut through the sclera by means of slow sawing movements. Then from the two ends of this small incision two shorter forward cuts were made to the limbus by turning the edge of the same narrow blade forward and sawing carefully to avoid puncture of the iris in the emptied anterior chamber. The result in most cases, Herbert says, was a permanently permeable cicatrix which was sufficient to reduce the tension to normal in moderate degrees of glaucoma. In very hard eyes, however, he found it advisable to make the incision longer than 2 mm., and as this involved the possibility of a prolapse of the iris in some cases, he now prefers to operate from above the cornea, so as to allow of a small prophylactic iridectomy in cases where he judges the danger of prolapse to be appreciable. In operating above the cornea, the projection of the brow makes it impossible to introduce an ordinary Graefe knife at the required angle. Therefore Herbert

employs a narrow keratome (in his latest article[2] he recommends a bent broad needle 3·5 mm. wide) for the first incision, and for the forward cuts a trowel-handled knife with two bends and a small blade with a rounded end (a modified Bell-Taylor cataract knife). A small iridectomy is only considered necessary in cases where the iris fails to respond to eserine, and in any case a small peripheral button-hole is sufficient to prevent prolapse.

To facilitate the performance of the forward cuts, Bishop Harman[3] has devised the twin scissors as illustrated (*Fig.* 82). He makes a conjunctival flap by one of the various methods detailed in his article. The keratome is inserted into the sclerotic 3 mm. from the clear corneal margin, and passed through until its point appears in the corneo-iridic angle. It is pushed on until the resulting incision is of the required width. Now the male blade of the twin scissors is

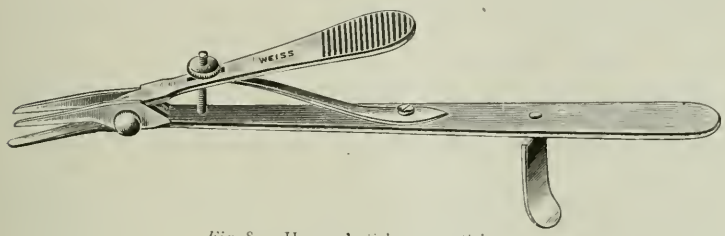

Fig. 82. Harman's Sclerotomy Scissors.

pushed along the track of the wound until the projecting 2 mm. of the blade shows within the anterior chamber. The scissors are then closed, the cuts made, the male blade gently withdrawn, and with the replacement of the conjunctival flap the operation is complete.[4] With the earlier of these instruments there was sometimes a difficulty in making the cut of the scissors clean, but with the latest pattern Harman claims that this drawback has been overcome.[5]

How far Herbert's operation, or the somewhat similar operation of trephining the sclera,[6] will supplant the older operation of iridectomy and sclerotomy, must at present be left an open question; for acute glaucoma the operation of iridectomy will probably always hold its own.

References.—[1]*Trans. Ophth. Soc.* xxx, 199; [2]*Ophthalmoscope*, 1911, 762; [3]*Ibid.* 769; [4]*Ibid.* 109; [5]*Ibid.* 775; [6]*Med. Ann.* 1911, 336.

GLEET.

(*Vol.* 1910, *p.* 39)—Filtered milk cultures of **Lactic Acid** bacilli, injected night and morning, one ounce at a time, are effective in curing chronic cases.

GONORRHŒA. *C. F. Marshall, M.D.*

Gonorrhœa in Male Children.—Wolbarst[1] has observed 37 cases of gonorrhœal urethritis in boys, and concludes that this infection is by no means rare, although much less common than gonorrhœal infection in female children. Infection may be due to precocious sexual activity

or to accidental infection, through infected towels, catheters, etc. There were no complications of importance in his cases, but other observers have noted gonorrhœal arthritis. The cases varied in age from 16 months to 14 years, the majority of infections occurring between the ages of 4 and 10 years, and between 12 and 14.

Treatment.—This is practically the same as in the adult. Wolbarst prefers injections of **Protargol,** 1–400, or **Argyrol** 1–100, the solutions being injected twice daily with a small syringe, and retained for five to ten minutes. He is of opinion that some cases of sterility, sexual neurasthenia, and urethral stricture may be due to gonorrhœal infection in childhood.

Diagnosis.—*Complement Fixation.*—In 1906 Müller and Oppenheim[2] tried the complement fixation test in the diagnosis of gonorrhœal infection, and found that the serum of a patient with gonorrhœal urethritis gave a positive reaction, thus indicating that the serum in gonorrhœal infection contains a specific antibody for the gonococcus. Serum from patients free from gonorrhœal infection gave a negative reaction. These results were confirmed by Brück.[3] Schwartz and McNeil[4] have recently applied the test to 324 cases. Serum was taken from persons of both sexes suffering from acute or chronic gonorrhœa. Controls were taken from persons having no history or signs of gonorrhœa, and from patients suffering from other diseases. All tests were done in duplicate, using both anti-sheep and anti-human hæmolytic systems. The technique used was that of the Wassermann test for syphilis, and Noguchi's modification of it. The antigen was prepared from nine to twelve different strains of gonococci, not from one strain only, as the authors found that different strains of the gonococcus differ considerably, so much so that the antibodies produced in the body by the toxin of one strain will often fail to fix complement in the presence of an antigen prepared from another strain. Hence, if one strain only is used in preparing the antigen, many negative results will be obtained which should be positive. The cases tested included acute and chronic gonorrhœal urethritis, acute and chronic non-specific urethritis, chronic prostatitis, epididymitis, joint affections, and gynæcological cases. In acute anterior gonorrhœal urethritis the reaction was negative, probably because the absorption of toxins is insufficient to stimulate the production of antibodies. In the other cases the reaction was positive in the majority of cases in which there were signs or history of gonorrhœa. In 51 cases of clinically cured gonorrhœa in the male, 22 gave a positive reaction. It is interesting to note that all cases treated with gonococcal vaccines gave strong positive reactions; this seems to confirm the idea that antibodies specific for the gonococcus are readily formed in the human body. How far a negative reaction can be relied upon to prove that a patient is cured, or to exclude gonorrhœal infection, remains for further research to show. The authors consider that a positive reaction signifies the presence of a focus of active gonococci somewhere in the body, and if found in persons supposed

to be cured of gonorrhœa, probably means that they are still infectious. The importance of this in connection with marriage is obvious. The reaction is also useful in differentiating between gonorrhœal and other forms of arthritis.

Cutaneous Reaction.—Watabiki[5] has tested the value of a cutaneous reaction in cases of gonorrhœa, by injection of gonotoxins. One gonotoxin was prepared according to Chantemesse's method for preparing typhotoxin. Blood-agar culture of gonococcus is dried in a sulphuric acid desiccator, pounded in an agate mortar, emulsified in sterile water, treated by the shaking apparatus for 24 to 48 hours, and then centrifugalized. The supernatant fluid is poured off and mixed with 10 parts of absolute alcohol to precipitate the gonotoxin. The latter is then dried in a desiccator and made into a 20 per cent watery solution. Another gonotoxin was prepared in the same way as tuberculin. A three weeks' blood-serum-bouillon culture of gonococcus is heated to 60° C. for one hour, concentrated to one-tenth its volume, and then filtered. Gonorrhœal arthritis gave a positive reaction to both preparations, but gonorrhœal urethritis and other local infections gave a negative reaction to both. The author explains these results by assuming that local gonococcal infection does not produce the antibodies which are necessary for the reaction, while general gonococcal infection does produce them. The cutaneous reaction is therefore useful in the diagnosis of general but not local infection.

Brück[6] states that in gonorrhœal infection an over-sensitiveness of the skin develops, which manifests itself as a cutaneous reaction after injection of gonococcal vaccines.

Treatment.—Magian[7] recommends the following method for the *rapid* treatment of gonorrhœa, a method which he claims will effect a cure within a week, provided the disease is treated early enough. The apparatus required consists of four glass irrigator vessels, fitted with suitable stoppers, taps, and rubber tubing, and several two-way irrigator tubes and simple nozzles of various sizes. Three of the jars hold 3 or 4 gallons, the other 1 gallon. The drugs used for injection are **Permanganate of Potash, Protargol, Chloride of Gold, Sulphate of Zinc,** and **Nitrate of Silver.** Internally, **Allosan** tablets are given. The stages are as follows: (1) A 3-gallon irrigation up to the neck of the bladder, with 1–5000 permanganate; (2) A 3-gallon irrigation with distilled water, followed by a similar quantity containing one ounce of protargol, sufficient pressure being used to distend the mucous membrane; (3) Irrigation with 2 pints of chloride of gold solution (15 gr. to the pint), followed by washing out with distilled water. This irrigation is done with a single-way nozzle, the others with a two-way nozzle; (4) Injections of ½ per cent protargol solution by the patient himself eight or ten times during the next 24 hours; after this a 6-inch Neisser bougie containing 1 per cent protargol and 2 per cent antipyrin is tied in at night; allosan tablets every three hours during the day. The irrigations are repeated in increasing strength on the

second, third, and fourth days; (5) On the fifth day, an irrigation of weak sulphate of zinc solution, and on the sixth day weak nitrate of silver. The strength of the last irrigations varies with the severity of the case. After all this, the cure is said to be almost invariably complete. Microscopic examination of urethral swabs shows no gonococci at the end of the week, and there is no discharge or urethral filaments. The author has used this method in 100 consecutive cases, and in only three was a cure delayed beyond the seventh day. The solutions should be used warm, except the protargol. He attributes the success of the method to the use of large quantities of the solutions under pressure, and also to their use in sequence. He considers moving fluid more efficacious than retained injections. The action of the chloride of gold is difficult to explain. The addition of antipyrin to the soluble bougies has a beneficial effect.

Schindler[3] advocates the use of **Atropine,** 2 or 3 mgrams daily, in all cases; the object being to put the affected organs at rest by preventing the automatic and reflex muscular movements of the sexual organs, which are regulated by the hypogastric plexus. The principle is the same as in administering atropine in cases of bronchial asthma, chorea, etc. According to the author, 2 or 3 mgrams of atropine can be given daily for several weeks, and only rarely causes disturbance of accommodation and dryness of the throat. However, it is seldom necessary to give it continuously for more than two weeks. The author administers the atropine in hollow suppositories containing 1 c.c. of a 1 per cent solution of atropine. The drug is more rapidly absorbed in this way than in the usual suppositories of cacao-butter, and is said to relieve tenesmus in a few minutes. In addition to this, atropine is also applied to the urethra, with a view to prevent extension of the gonorrhœal process to the epididymis by paralyzing the retrograde reflex movements of the vas deferens, and also to paralyze the secretory nerves of the urethral glands, thus checking the growth of gonococci by producing dryness of the urethra. The cure of gonorrhœa is interfered with by retrograde or antiperistaltic movements caused by the irritation of certain forms of treatment, such as massage of the prostate and the application of silver nitrate. Besides giving rise to retrograde contractions, silver nitrate is very painful. Siebert has recently compared the bactericidal value of the silver preparations, and finds that the albuminous compounds of silver are much superior to silver nitrate. The author prefers **Protargol** ($\frac{1}{4}$ to $\frac{1}{2}$ per cent) in posterior urethritis, instead of silver nitrate. In most patients the resistance of the compressor muscle is so weakened that injections can be made to reach the posterior urethra with an ordinary syringe, especially if a little cocaine is added to the protargol solution. This treatment can be carried out three times daily by the patient himself, with a $\frac{1}{4}$ per cent solution of protargol, even in the most acute cases of posterior urethritis, according to Schindler. If this treatment is insufficient, he employs Janet's method of irrigation, and would only have recourse to Guyon's catheter in the rare cases

in which the compressor cannot be overcome without undue force. The posterior urethra can usually be reached by injected fluid without a catheter, when protargol is used; whereas the only way of reaching the posterior urethra with silver nitrate is through a Guyon's catheter, injection of this drug (1 or 2 per cent) with the ordinary syringe causing spasmodic contraction of the compressor muscle. According to Schindler, this treatment of the posterior urethra by injection of protargol with the syringe never sets up epididymitis, even in acute cases. In acute *anterior urethritis*, Schindler first syringes out the anterior urethra with 1–4000 oxycyanide of mercury solution, and then injects two successive syringefuls of protargol solution, 3 or 5 per cent, according to the severity of the inflammatory process, with 1 per cent cocaine. Each syringeful is retained for 10 to 15 minutes. The protargol should not be stirred up during solution, but simply dusted on the surface of cold water, and left for about half an hour to dissolve. When prepared in this way it causes little irritation, even in the strength of 3 to 5 per cent. The second syringeful sometimes causes smarting, but this is relieved by a small injection of 1 per cent cocaine. Schindler considers **Cocaine** indispensable in the treatment of gonorrhœa, and in his experience it never gives rise to unpleasant symptoms. His routine treatment is as follows: The patient applies two or three suppositories daily, each containing one mgram of atropine, and injects the anterior urethra with a half per cent solution of protargol thrice daily, two syringefuls at a time, the first being retained five minutes and the second ten. On the second and third days the surgeon injects two syringefuls of a 3 or 5 per cent solution of protargol. In many cases the gonorrhœa is cured by the third or fourth day; in most cases within 14 days. In some cases Schindler replaces the protargol after a time with **Ichthargan** 1–3000, one syringeful of which is injected thrice daily and retained for five minutes. If the urine remains turbid, protargol is resumed. In cases in which the discharge and gonococci persist for several weeks, the anterior urethra is irrigated with a $\frac{1}{4}$ per cent solution of protargol in oxycyanide of mercury, 1–4000. According to Schindler, this method of treatment can be used in all cases of acute gonorrhœa, as well as in subacute cases. He does not regard it as an abortive method in the strictest sense of the word, but claims that it often effects an abortive cure.

For the employment of **Albargin**, *see page* 4.

Urethral Germicides.—Clark and Wylie[9] have compared the bactericidal values of argyrol, protargol, lysol, collargol, and cargentos with that of **Silver Nitrate**, and conclude that the latter is far more powerful than any of the other preparations. The organisms used were streptococcus, staphylococcus, *Bacillus coli*, and gonococcus. Controls for each organism were made, and the average number of colonies per plate was noted. As regards the gonococcus, abundant colonies were obtained after 30 per cent argyrol and 10 per cent protargol, 2·5 per cent collargol, and 5 per cent cargentos, but none

after 2·5 per cent lysol; silver nitrate in the strength of 1–5000 was sufficient to inhibit the growth of gonococci. Concerning the alleged virtues of the other silver preparations, the authors remark that they do little more than cleanse the surface, dilate the urethral canal, and cause mild and transient hyperæmia, which assists nature's cure. As regards penetrating power, they mention the experiment of Wildholz[10] with protargol and silver nitrate on the living mucous membranes of the eye and urethra in dogs, the silver being reduced by exposure to Finsen light. Solutions of 1–1000 and 1–100 silver nitrate and 1 to 3 per cent protargol penetrated to the subepithelial tissue. In penetrating power silver nitrate was easily first. They also point out that the degree of penetration is of little use, owing to the power of the body fluids to destroy the bactericidal power of antiseptics.

Urethritis of Chemical Origin.—Robinson[11] reports several cases of acute urethritis caused by the injection of chemical irritants. He considers that such cases are more common than is generally supposed, and that they are sometimes due to the over-zealousness of physicians. He especially condemns the unscientific and unjustifiable silver nitrate test which is responsible for many cases of chemical urethritis. The diagnosis of this condition is made by the history of the case, the absence of gonococci, and the improvement after leaving off treatment. For the treatment of chemical urethritis he recommends warm **Sterilized Olive Oil** or almond oil, containing a half to one per cent solution of **Iodoform** or **Thymol Iodide.** Any tendency to stricture should be prevented by dilators or sounds dipped in the above oil.

Vaccine Treatment.—Friedlander and Reiter[12] find that vaccine treatment gives good results in acute and subacute gonorrhœal epididymitis and follicular prostatitis, but not in acute or subacute gonorrhœal urethritis. The vaccines used were (1) Reiter's, which contains 5 million gonococci per c.c.; and (2) Brück's, which contains 20 million cocci per c.c. Reiter recommends small doses of 0·2, 0·4, 0·6, exceptionally 1·5 or 2 c.cm., with intervals of four to seven days. Brück[13] considers a strong reaction and rise of temperature necessary for active immunization, and uses 0·5, 1·0, 1·5 and 2·0 c.cm. of his vaccine at intervals of three or four days. Friedlander thinks that Reiter's vaccine in small doses is suitable for mild and ambulatory cases, while Brück's may be useful in severe and rebellious cases. However, he points out that the number of gonococci per cubic centimeter is not the only point to be considered; the age and activity of the cultures are also factors. While adhering to Wright's rules that injection should never be repeated during the negative phase following the first injection, and that if the negative phase lasts more than 24 hours the dose is too large, the authors do not consider estimation of the opsonic index necessary in localized foci of gonococci, but recommend it in general gonococcal septicæmia. Although an autogenous vaccine is to be preferred when obtainable, it is often necessary to use standard vaccine. (*See also page* 62.) Schindler[14] considers that the indications for vaccine treatment are limited to cases of epididy-

mitis, chronic prostatitis, arthritis, and gonorrhœa of the adnexa. As regards epididymitis, he uses vaccine only in severe cases, and remarks that after this treatment nodules remain which require other procedures, such as puncture, incision, hot fomentations, etc. Schindler agrees with Brück that it is advisable to produce a reaction with rise of temperature, which is effected by a dose of 30 million cocci. However, he recommends small doses in cases where there is already high temperature. He remarks that the vaccine has no bactericidal action on the gonococci, for the latter multiply in cases of acute gonorrhœa treated by vaccines, and he has seen epididymitis and salpingitis develop in spite of vaccine injections. He concludes that the value of vaccine treatment should not be over-estimated. Even with careful selection of cases, there are inexplicable failures as well as astonishing successes.

Hildebrand[15] recommends the injection of **Tr. Iodi** for gonorrhœal arthritis. He has treated several cases of arthritis of the knee and one of the hip joint by this means. The injection is soon followed by swelling of the joint, which quickly subsides. After a few days the joint becomes quite painless, swelling subsides, and mobility returns. There is no tendency to the formation of adhesions, as shown by a case reported by Roux, in which a joint was found after death in a perfectly normal condition six months after injection of tincture of iodine. Some caution is necessary as regards the quantity injected, as severe toxic effects and even deaths have been reported after injection in cases of purulent arthritis. Hildebrand used 5 grams of the tincture. He considers that the drug destroys free gonococci, and, owing to its penetrative action, gonococci situated in the tissues. The increase of local and general temperature following injection is also said to have a destructive action on the gonococci.

Gonorrhœal Arthritis.—Subcutaneous injections of **Silver Atoxyl** recommended (*page* 59).

REFERENCES.—[1]*Med. Rec.* 1910, Oct. 29; [2]*Wien. klin. Woch.* 1906, No. 19; [3]*Deut. Med. Woch.* 1906, 70; [4]*Amer. Jour. Med. Sci.* 1911, May; [5]*Glasg. Med. Jour.* 1911, Mar; [6]*Deut. Med. Woch.* 1909, 471; [7]*Brit. Med. Jour.* 1911, June 24; [8]*Berl. klin. Woch.* 1910, Oct. 3; [9]*Jour. Amer. Med. Assoc.* 1911, i, 394; [10]*Zeits. f. Urol.* 1907, 185; [11]*Med. Rec.* 1911, Ap. 8; [12]*Berl. klin. Woch.* 1911, 1409; [13]*Deut. Med. Woch.* 1909, 471; [14]*Ibid*; [15]*Berl. klin. Woch.* 1911, 1409.

GOUT.

Robert Hutchison, M.D., F.R.C.P.

ETIOLOGY.—In an address reviewing the present state of our knowledge of the *relation of uric acid to gout*, Magnus Levy[1] asks: What are the facts in gout which are established with such accuracy that we can take them as a basis for our consideration? What results are sufficiently probable to be taken into serious discussion? The facts and the probable truths are as follows: (1) The presence of uric acid in the blood. (2) The presence of crystalline deposits. (3) The increased output of uric acid in the attacks of gout: the augmentation of which can reach from 0·3 to 0·5 gram daily and more, and may sometimes last

for a week, or even two. (4) A decline in the output of uric acid often precedes the attack of gout, but this diminution is not as marked as the subsequent increase, and its duration is only one or two days. (5) In the intervals between the attacks of gout the elimination of endogenous uric acid is asserted to be lower than in health; there are doubts whether this statement has been proved beyond question. (6) The elimination of exogenous uric acid is often retarded.

To elucidate the connections between these data it would be necessary to have a complete knowledge on the quantitative side of the following processes in both health and disease: (1) Of the formation of uric acid; (2) Of its destruction; (3) Of its elimination by the kidneys. From a combination of these three processes would arise a knowledge: (4) Of the accumulation of urates in the body, especially in the blood; (5) We ought to know the conditions of the sodium urate precipitation in the tissues, as well as the conditions for its removal. Herein is included a knowledge of the physical and chemical behaviour of sodium urate.

He then considers some of these problems, and concludes that there is no evidence of any increased formation of uric acid in gout, nor of any great decrease in its destruction, but that the retention of uric acid is due to "a deficient and restricted secretory power of the kidney." The existence of such inadequacy does not mean a real nephritis. It is possible that a single function of the kidney can become almost exclusively insufficient. Later on, real damage to the kidney and a nephritis frequently follow. He admits the clinical difficulties in connection with this view (why, for instance, does not every case of nephritis result in gout?), but can find no other solution of the problem.

Atophan useful in (*pages* 7, 8); **Harrogate Waters** (*page* 17); **Radium** emanation (*page* 84); **Ionization** (*page* 95).

REFERENCE.—[1]*Amer. Jour. Med. Sci.* 1910, Nov.

GRANULATING SURFACES, SCARLET-RED IN TREATMENT OF.
(*See* ULCERS.)

GRANULOMA PYOGENICUM. *E. Graham Little, M.D., F.R.C.P.*

This is the name proposed by Hartzell to replace the term "botryomycosis," the use of which has been dropped since Bodin demonstrated that the so-called botryomycetes were identical with *Staphylococcus aureus*. Wile[1] reports two fresh cases in which histological examination was made. The features of this infection are: A rapidly growing tumour, usually pedunculated, developing on the site of an injury, often ulcerating superficially, and in such cases bleeding freely, and prone to recur after removal unless the base is cauterized. Histologically, the tumour is bounded by epithelium, and consists of young connective tissue with blood-vessels so numerous and large as to suggest an angioma. The hands and feet are the commonest positions, but the tumours may occur anywhere. No fungus, as was earlier supposed,

is responsible for the growth, but an attenuated form of *Staphylococcus aureus*.

TREATMENT consists in **Removal** of the tumour and in **Cauterization** of the base.

REFERENCE.—[1]*Jour. Cutan. Dis.* 1910, 663.

HÆMOPHILIA. *Robert Hutchison, M.D., F.R.C.P.*

ETIOLOGY.—It is now generally admitted that hereditary hæmophilia is directly due to *defective coagulability of the blood*, and further evidence in favour of this view has been brought forward by Addis[1] as the result of the investigation of twelve cases. He attributes the defective coagulability to an inherited peculiarity in the constitution of the prothrombin, whereby its activation into thrombin is retarded.

Sahli,[2] on the other hand, considers that the diminution of the coagulation power is due to lack of thrombokinase, and that hæmophilia consists in a cellular anomaly both of the blood corpuscles and the endothelial cells of the vessels.

TREATMENT.—Cases showing the beneficial results of the **Transfusion of Human Blood** in collapse from severe bleeding in hæmophilia have been recorded by Hahn[3] and by Goodman.[4] The patient in each case was a child, and anastomosis was established from the radial artery of the donor to the femoral or basilic vein of the patient, transfusion being continued in one case for fifteen and in the other for twenty-eight minutes. In both instances immediate and striking benefit resulted, and all further oozing from the site of bleeding stopped.

For the possible value of **Ascitic Fluid** in hæmophilia, *see page* 6.

REFERENCES.—[1]*Quart. Jour. Med.* 1910, Oct.; [2]*Brit. Med. Jour.* 1910, Nov. 5; [3]*Med. Rec.* 1909, Oct. 8; [4]*Ann. Surg.* 1910, Oct.

HÆMOPTYSIS.

(*Vol.* 1909, *p.* 590) — As an emergency treatment the inhalation of **Amyl Nitrite** from a broken glass capsule should always be used.

HÆMORRHAGE, CEREBRAL. (*See* BRAIN.)

HÆMORRHAGES IN THE NEW-BORN.

(*Vol.* 1911, *p.* 444)—There is evidence to show that **Gelatin** is of real value. It may be given orally (Gelatin gr. xxx, Sodium Chloride gr. ij, Distilled Water ʒiij, one drachm hourly) or subcutaneously. The latter method, however, introduces some risk of tetanus.

HÆMORRHOIDS. *Sir Charles Ball, M.Ch., F.R.C.S.*

Hirschman's[1] method of operation under local anæsthesia is as follows. A sterilized 1 per cent solution of quinine and urea hydrochloride is used. This is made by dissolving quinine hydrochloride in hydrochloric acid, adding pure urea, filtering the mixture through glass wool, and allowing it to crystallize. It is non-toxic, and can be given in unlimited dosage. The hæmostatic effect produced by the deposition and contraction of fibrinous exudate around the blood-vessels is of great value in preventing post-operative oozing, the anæsthetic effect is prolonged, and it is very much cheaper than cocaine.

But few instruments are required; a half ounce aseptic hypodermic syringe provided with a fine-calibre sharp-pointed needle 2 in. in length, scalpel, pointed scissors curved on the flat, blunt-pointed, long-handled, curved ligature-carrier, Hirschman's pile forceps, and sometimes a Sims retractor.

The patient is given $\frac{1}{4}$ gr. of morphine about twenty minutes before operation, a soap-suds enema followed by a boracic acid enema is given, and the patient is placed on the operating-table in the right or left lateral position. After the region of the anus is washed and sterilized, the sphincter is anæsthetized by the injection of from 10 to 30 min. of the above solution. The technique is as follows:—

A point half an inch below and behind the posterior commissure of the anus is selected and touched with a swab moistened with pure phenol. After waiting two or three minutes, or until this point is thoroughly blanched, the needle of the syringe is passed inward, upward, and laterally for about three-quarters of an inch, gradually going down into the sphincter muscle on one side, but not entirely through it. While doing this it is well to pull down the sphincter by the index-finger of the left hand passed into the anus while the injection is being made with the right. From 10 to 20 drops of the solution are slowly injected, and the needle is retraced to the point of puncture, but not withdrawn. It is then pushed up on the other side in the same manner, and this side is likewise injected. Three or four minutes are allowed to elapse for the anæsthesia to become complete.

After dilatation has been accomplished, the most dependent hæmorrhoid is injected with the 1 per cent quinine and urea hydrochloride solution, enough being injected to blanch the hæmorrhoid and give it the appearance of a Malaga grape. The lower extremity of the hæmorrhoid is then grasped with the pile forceps and pulled down so that it is on the stretch. The long-handled ligature carrier threaded with No. 2 twenty-day chromicized catgut is passed in through the mucous membrane of one side down to the base of the hæmorrhoid and around to the opposite side, in such a manner as to include the upper third of mucous membrane covering the pile and the blood-vessels which run longitudinally underneath, but not encircling the whole hæmorrhoid as in the old ligature operation. This ligature should be placed just at the juncture of the hæmorrhoid and the normal mucous membrane of the rectum. It is then firmly tied, when it will be found that the principal blood-supply of the hæmorrhoid has been included in the ligature and shut off. The hæmorrhoids on either side are dealt with in like manner, and lastly the anterior and upper ones.

A suppository containing orthoform 3 gr., thymol iodide 3 gr., and quinine hydrochloride 20 gr., is inserted, the patient is kept in the recumbent position for ten minutes and then allowed to rise from the table. There will be a certain amount of œdema or swelling during the first twenty-four hours, but this gradually disappears and is of no consequence. The hæmorrhoids gradually shrink until, at the end of

three or four weeks, there is nothing left but a small knot of connective tissue, which can be painlessly snipped off or left.

This technique is peculiarly adapted to those desperate cases of anæmia in which the daily loss of blood from the hæmorrhoids is far greater than the patient's blood production. It can be performed in ten or fifteen minutes.

In the majority of cases, when the necessity for haste and conservation of blood-supply is not quite so imperative, the technique is as follows :—

Anæsthetization, dilatation, and ligation are performed as above. The hæmorrhoidal tumours are then grasped in order by the pile forceps and incised in their longitudinal axes from a point about a quarter of an inch below the ligature, and extending down to their distal extremities. After separation of the sides of the incision, the blood-vessels and connective tissue which make up the body of each pile are dissected out *en masse* with the curved scissors and cut off a quarter of an inch below the ligature. This longitudinal wound in each case is allowed to remain open, and heals in from three to five days without suture. This disposes of the hæmorrhoids at once, and does away with much of the swelling which necessarily follows the preceding technique.

REFERENCE.—[1] *Jour. Amer. Med. Assoc.* 1910, ii, 1371.

HAMMER-TOE.

(*Vol.* 1911, *p.* 356)—Wheeler's operation is very simple : no general anæsthetic is needed, and the toe is not sacrificed. The paragraph is illustrated.

HAY FEVER. (*See* NOSE, DISEASES OF.)

HEART, CONGENITAL MALFORMATIONS OF.

Carey Coombs, M.D., M.R.C.P.

Walker[1] considers it possible to subdivide cases of congenital pulmonary stenosis into three groups : that of "high stenosis," in which there is a systolic thrill with a bruit loudest at the pulmonary cartilage ; that of "low stenosis" with similar signs, but maximal at a lower level ; and that in which the coincidence of a patent ductus arteriosus is indicated by a continuance of the bruit into diastole. Here the bruit is usually maximal at the pulmonary area. An area of abnormal dullness is found at the base of the heart, especially in the third type ; and in this group there may be a water-hammer pulse with capillary pulsation. In such cases the symptoms are less severe, and the outlook is more favourable. He has found a rheumatic history common either in the patient or his family.

Mead[2] records a case of left recurrent laryngeal palsy due to compression by a persistent and dilated ductus arteriosus. Parkes Weber and Dörner[3] bring forward evidence to show that in a case of congenital heart disease with polycythæmia there was an increase of the total volume of the blood ; so that the oxygen-carrying capacity of the blood was increased in two respects : first, each cubic millimetre of

blood contained an abnormally large number of red blood corpuscles ; and, secondly, the body contained an abnormally large number of cubic millimetres of blood.

REFERENCES.—[1]*Heart*, ii, 249 ; [2]*Jour. Amer. Med. Assoc.* 1910, ii, 2205 ; [3]*Lancet*, 1911, i, 150.

HEART, DISEASES OF. *Carey Coombs, M.D., M.R.C.P.*

ETIOLOGY AND PATHOLOGY.—The part played by *strain* in the causation of organic disease of the heart has been under discussion during the year. The conclusions arrived at go to confirm the opinion of Sir T. Clifford Allbutt (quoted in last year's *Annual*) that muscular overstress does not inflict permanent injury except on a heart already weakened by infective or arterial disease. It is convincing to find this attitude taken up not only by English physicians at the Royal Society of Medicine[1] but also at the Congress of the Societa Italiana di Medicina Interna.[2] At the former meeting Davy suggested that the toxæmia of *oral sepsis* may so injure the myocardium as to render overstress effective in the production of disease.

Raneletti[3] considers fully the influence of strain and direct injury in the production of valvular disease. His opinion is that a single great strain is liable to cause valvular insufficiency by rupture ; this is oftenest seen in the aortic valve, where one or two segments may be detached, but it also occurs in the mitral valve with rupture of chordæ tendineæ. Repeated strain and contusion, on the other hand, cause valvular inflammation, ending sometimes in stenosis, sometimes in insufficiency. Whatever the type of injury, it is more likely to be effective if the valve is already diseased.

Several systematic researches into the *pathology of the a-v bundle* have been productive of positive results. Engel[4] found fatty change common in the fibres of the bundle after the age of forty, though apparently it has but little effect on its function. Sternberg[5] examined the hearts from seventy-two cases of sudden death, and found minor lesions in the bundle in most ; but similar changes were also present in the ventricular musculature generally. Amenomiya[6] examined twelve hearts from cases of diphtheria, and found fatty change in the *a-v* bundle, as well as in the rest of the myocardium, in almost every one. Fleming and Kennedy[7] examined the heart of a child who developed complete heart-block during a fatal attack of diphtheria, and found several lymphocytic foci, one of them quite large, in the *a-v* bundle. Cowan, Kennedy, and others[8] discovered inflammatory lesions in the *a-v* node and bundle in two cases of acute ulcerative endocarditis. They associate a prolongation of the *a-c* interval (i.e., the time elapsing between the beginning of the auricular wave and that of the carotid wave in the jugular tracing) in one patient, with a lesion found in the bundle itself. Cohn, Holmes, and Lewis[9] describe a case of Stokes-Adams' disease with normal cardiac sequence, apart from the attacks. No lesion could be found in the nervous system, but in the *a-v* bundle, especially in the main stem and the left branch,

there were sclerosis, fatty infiltration, and compression of the fibres by blood sinuses. Holst and Monrad-Krohn[10] in their first case proved auriculo-ventricular sequence of normal character by tracings taken seventeen days before death; yet examination of the bundle of His showed it completely destroyed at one part of its course by a chronic, calcified lesion. In this case auricle and ventricle must have had some functional connection other than the *a-v* bundle. In their other case (that of a diabetic), there was an incomplete and varying heart-block, as tracings proved; post mortem the *a-v* bundle was absolutely normal, but in both vagi degenerative changes were demonstrated.

The *direct causation of malignant endocarditis* continues to excite investigation. Cecil and Soper[11] give a comprehensive account of malignant endocarditis due to the *meningococcus*. Satterthwaite's[12] analysis of hospital records confirms the work of others in the emphasis laid upon the *streptococci*. Venning[13] concludes, from a survey of post-mortem records, that the connection between rheumatism and some cases of malignant endocarditis is a simple one, that there is in fact a malignant form of rheumatic endocarditis.

Warthin's[14] important paper on *congenital cardiac syphilis* is based on post-mortem investigation of twelve cases. He states that there exists a special form of fibroblastic interstitial myocarditis, localized or diffused, due to congenital syphilis. The *Spirochæta pallida* has been demonstrated in the lesions. There are also degenerative changes in the muscular cells. There may or may not be other lesions of congenital syphilis associated with it. He believes it is an important cause of asphyxia neonatorum, and of sudden death in early life. Further, it forms a basis for subsequent infective diseases of the heart, and for fibroid heart and coronary sclerosis in later years. It is often associated with infantilism and under-development.

Paroxysmal Tachycardia.—Laslett[15] finds that extrasystolic irregularity may be complicated by bursts of tachycardia of auricular origin, brief in duration. Lewis[16 17] describes two cases in which there was no auricular wave during the attacks, apparently because auricle and ventricle were beating together. Wenckebach's[18] explanation of such cases is that there is a "critical" frequency of the heart, about 180 beats per minute, in which the auricular systole of one beat coincides with the ventricular systole of the preceding beat. This produces auricular stasis ("obstipatio sanguinis" is his graphic term), together with all those signs of cardiac distress (dilatation and venous engorgement) which accompany such attacks. The actual critical speed will of course vary a little with the state of the cardiac muscle and the length of ventricular systole. Hering[19] thinks the ectopic origin of some cases of auricular paroxysmal tachycardia, as well as of the auriculo-ventricular type, is probable, but not proved.

Coupled Rhythms.—Cowan and Ritchie[20] contribute an exhaustive analysis of this difficult subject. Within the term "coupled rhythm" they do not include "pulsus alternans" (see below), but only those

conditions in which a short pause and a long pause are paired together, thus ; first beat—short pause ; second beat—long pause.

1. Coupled rhythms of ventricles only *may* occur in : (*a*) Incomplete heart-block ; (*b*) The autogenetic ventricular rhythm of complete block ; (*c*) Total arrhythmia ; (*d*) Ventricular extrasystole following each normal beat.

2. Coupled rhythm involving auricle and ventricle *may* be found in : (*a*) Auricular extrasystoles alternating with normal beats ; (*b*) " True beginning " coupled rhythms are always due to organic disease. An interesting suggestion is that overcharging of an irritable ventricle may serve to provoke extrasystolic contractions.

Total Irregularity.—The important researches of Lewis, described in last year's *Annual*, by which this form of arrhythmia has been convincingly associated in the " fibrillation " of the auricles, have been confirmed by Jolly and Ritchie,[21] working with the polygraph and the electrocardiograph. We have yet, however, to find a full answer to the question, What makes the auricle go into a state of fibrillation ? Lea's[22] paper shows that in a series of cases of heart disease exhibiting total arrhythmia 32·8 per cent were cases of cardiosclerosis, 31·3 per cent of mitral stenosis, and 23·8 per cent of " cardiac dilatation." Influenza was noted as having occurred in 30·3 per cent of non-rheumatic cases. The importance of a fuller understanding of this question may be gauged by the fact, as stated by Mackenzie,[23] that auricular fibrillation is the immediate cause of 70 per cent of all cases of heart failure.

Hemisystole.—This term has been applied to a condition which has been thought, but not proved, to exist, and it signifies contraction of one ventricle without the other. Stengel and Pepper[24] claim that a case of heart-block, recorded by them, furnishes evidence of genuine hemisystole, the left ventricle contracting while the right failed to do so.

Lesions of Conductivity.—The actual mode of production of some types of auriculo-ventricular block is still uncertain. We know that some cases are due to gross lesions of the bundle of His ; we know, on the other hand, that exaltation of the vagus influence can interfere with conductivity. Between these extremes lies an indefinite clinical territory. Without giving any lengthy description of cases, we may refer to those described by Mackintosh and Falconer,[25] in which a very brief space of time separated two distinct phases—normal rhythm with normal *a-c* interval and a high grade of heart-block. There cannot have been gross damage to the *a-v* bundle in these cases ; on the other hand, it is hard to believe that long bouts of heart-block were due solely to vagus interference. On all fours with this are the observations of Lewis and Oppenheimer[26] on asphyxial heart-block, presumably due to the toxic action of CO_2. They find many similarities between this asphyxial block and that of Erlanger's clamp experiments. The inference is that toxic and nutritional alterations in the condition of the bundle itself, apart from gross injury by pressure of

inflammatory foci, may temporarily interrupt conductivity. (*See also above under* "Etiology and Pathology.")

Cardiovascular Degeneration.—In the Lumleian Lectures, Mitchell Bruce[27] points out the peculiar aptitude for degeneration of the circulatory apparatus, in that it carries on its own nutrition, and is therefore always prone to the establishment of a vicious circle. Of 100 cases, 92 were males (average age 58½) and 8 women (average age 63½). There was a history of syphilis in 26, of other infections (influenza, enteric fever, pneumonia) in 50, glycosuria in 15, gout in 44, alcoholism in 31. Tobacco was an unimportant factor, and so was manual labour. On the other hand, head work played a prominent part. For purposes of their study renal disease was excluded. He divides his cases into groups: syphilitic, metabolic, gouty, and those of overstress. The average age of "first symptoms" in the *syphilitic* cases was forty-nine on an average, twenty-five years after the primary sore. The disease is activated by all depressants of general resistance, such as alcoholism, renal disease, gout, and glycosuria. The chief symptoms are pain, dyspnœa, fainting attacks, and præcordial oppression. The aortic second sound is intensified, and there is often a regurgitation bruit in diastole. A small area of parasternal dullness is commonly found, and crepitations may be heard in the same area. The radial arteries usually feel normal. In the *metabolic* group sugar and albumin are found in the urine; the patients are free livers, corpulent, and often gouty. Only two out of twenty were women. Dyspnœa is the chief symptom; next comes pain, usually præcordial and not anginal. The heart is enlarged; mitral regurgitation is common, but the aortic signs are normal. In the *gouty* cases the signs and symptoms are much like those of the preceding class; but angina and aortic insufficiency are commoner. *Strain* appears as an etiological factor in several guises. It may be set up during youth, or adolescence, and perpetuated during after-years by worry; leading to a diminution of the available cardiac reserve; or it may be stress laid upon an already decrescent heart that is important. Emotional stress has more influence than intellectual.

Cardiac Failure.—Mackenzie's Oliver-Sharpey Lectures[23] contain a diatribe against the nebulous concepts of heart disease which lead to an unreasoning fear of arrhythmia and murmurs. He urges that there is much need for a fuller understanding of their causation, since they may (and often do) possess no prognostic significance. He insists on the importance of subjective symptoms (pain and other cardiac sensations, alterations in cutaneous and muscular sensibility, and dyspnœa), which, as he says, are the most reliable index of myocardial inefficiency—of exhaustion of the "work force" of the heart. The criterion of cardiac capacity is the amount of work that can be done without cardiac discomfort. The whole essence of cardiac failure is that it is an encroachment, more or less complete, on the margin of "work force" which the heart possesses; and one of the commonest forms of encroachment is auricular fibrillation (see above), which throws the whole heart into disorder of action.

Morison[28] calls attention to a sign of grave cardiac failure, to which he gives the name "*reversible pulmonary crepitations*." He says that "the well-marked crepitation denoting pulmonary congestion in the most dependent part is abolished, usually altogether, and almost always, by a single rotation of the patient on his own axis in bed, and in the short space of time which that movement occupies." This, he argues, must be due to passive hyperæmia of the distal portion of the pulmonary and bronchial venous system. All the patients have been men with impaired thoracic elasticity.

Windle[29] has investigated and classified the forms of *abnormal breathing* which are often associated with angina and an alternating pulse, in patients with failing contractility of the heart, especially in cardiosclerotics. The types are: (1) Dyspnœa on exertion, becoming continuous as the disease advances, and often out of proportion to the other signs; (2) Paroxysmal dyspnœa; (*a*) Of inverted type, inspiration being lengthened in proportion to expiration without any quickening of the respiratory rate; (*b*) Varying periodically as to rate and depth without actual cessation; (*c*) Of partially or fully developed Cheyne-Stokes type.

Aortic Regurgitation.—Michell Clarke[30] has given a full account of this lesion as it appears *in young subjects*. The main incidence is between ten and twenty years. Females are affected almost as much as males, though about 80 per cent of adult cases are males. This is explained by the fact that over 80 per cent of the juvenile cases are rheumatic, while the later cases are many of them syphilitic. The lesion is rarely uncomplicated in younger patients, also because most cases are rheumatic. For this same reason pericarditis is a common accompaniment. The mitral insufficiency that is often found is also due to concomitant rheumatic myocarditis. In Clarke's experience many of these patients have severe anginal attacks. Œdema is conspicuously absent, but hæmorrhages (epistaxis, hæmoptysis, hæmatemesis) occur sometimes. Albuminuria was found in thirteen cases out of thirty-three. The heart is often greatly enlarged, and the aorta also is dilated. The writer has noted a "thump" sound in the distal arteries, even in vessels as remote as the dorsalis pedis, apparently immediately after the arterial wave. This is, he says, only met with in cases of free regurgitation. The regurgitant murmur is often traceable to the apex, and when heard in such a position it is difficult, if not impossible, to say whether or not there is stenosis of the mitral valve in addition to the aortic lesion. When the heart is widened both ways, the regurgitant bruit is often heard best down the right sternal border. Minervini[31] finds *pulsatile lifting of the tongue*, as it lies on the floor of the mouth, a very constant feature of aortic regurgitation, and claims for it a considerable value in diagnosis.

Mitral Stenosis.—Macdonald Gill[32] considers that even when jugular tracings show that auricular systole has failed, a presystolic bruit may still be heard. Fetterolf and Landis[33] having studied the matter by means of frozen sections, conclude that *left recurrent laryngeal palsy* in

mitral stenosis is due, not to direct pressure by the left auricle, but to compression between the aortic arch and the left pulmonary artery, the latter being lifted up by the dilated left auricle. Ssawaljeff[34] observes that mitral stenosis may simulate aortic aneurysm by causing a diminution of the left radial pulse, as well as by paralyzing the left side of the larynx ; and to this may be added the statement of Kahler and Störk[35] that the left br nchus may be similarly compressed.

Diagnostic Methods.—**The Venous Pulse.**—Windle[36] shows that a definite fourth wave is not uncommon in normal persons if the heart is beating below eighty per minute, and that it does not coincide with a third heart sound, the one being present when the other is absent, in many instances. Barringer[37] does not think we are justified in diagnosing tricuspid stenosis from the presence of auriculo-systolic waves in the liver pulse ; these are common in normal persons, and have no clinical significance unless very pronounced.

Electrocardiography. — This method was described in last year's *Annual*. The principle is that the heart in contracting becomes an electric battery, as does any other muscle. The currents set up can be led off from the patient to a highly delicate galvanometer, and the resulting movements of the indicator photographed. The record thus obtained from a normal heart shows three upward waves (*P*, *R*. *T*) and two less important downward ones (*Q*, *S*) ; *P* = auricular systole, *R* = ventricular systole, *T* = systole of the basal portion of the ventricle. The extent to which this device has been used in research may be gauged by a perusal of Thomas Lewis's[38] important book based on his own exhaustive investigations. The chief clinical value of electrocardiography lies in the information it has yielded in the investigation of arrhythmia ; articles by James and Williams[39] and Barker[40] illustrate this. Much has been learnt as to the site of origin of extrasystoles ; James and Williams think these premature contractions may originate at the normal spot, the sino-auricular node, though, of course, it is likely that they are usually ectopic in origin. Ventricular extrasystoles yield a diphasic record like that of a straight strip of muscle contracting, and in all probability this represents the full scope of an extrasystole ; it does not bring into contraction more than a single segment of the ventricular wall, and is therefore ineffective. Paroxysmal tachycardia (*vide ante*) is found to arise sometimes from the auricle, sometimes from the auriculo-ventricular node, or even from the ventricle itself. By all workers with the electrocardiograph it is agreed that auricular fibrillation is the true explanation of the totally irregular pulse. This method is too expensive and cumbrous for wide clinical application to individual cases ; but as a means of disentangling the meaning of complex arrhythmias it is unequalled.

Phonocardiography. — Various instruments have been devised for making graphic records of the heart-sounds ; these differ from each other in the methods by which the sounds are collected, and also in the receiving apparatus. Descriptions of such contrivances and their scope of usefulness are given by Weiss and Joachim,[41] v. Wyss,[42]

Barker,[40] Ohm,[43] and Lilienstein.[44] The first-named workers, who were pioneers in this field, find that the systolic bruit of mitral regurgitation begins at the same moment as the beginning of the normal first sound, while that of aortic valvular disease is a little later. The diastolic murmur of aortic incompetence begins with the second sound. The first sound of mitral stenosis is in the majority of cases a little delayed, as compared with the electrocardiographic movement signifying ventricular systole, so that this movement coincides in part with the crescendo bruit of mitral stenosis. Interesting observations as to the nature of gallop rhythm have been made by von Wyss, working with this method ; but it must be confessed that the results hitherto obtained by phonocardiography are meagre, especially in view of the trouble involved.

Prognosis.—Mitchell Bruce[27] says that in estimating the future of a case of *cardio-vascular degeneration*, due regard must be had to the patient as well as the disease : to his heredity, his temperament, and to his circumstances. The benefit to be anticipated from the removal of such deleterious influences as are susceptible of removal has also to be allowed for. The outlook depends largely on the type of disease ; the patients with aortic syphilis died in $5\frac{1}{4}$ years from the onset, on an average, at the age of 52, while when the disease was due to strain, death was deferred for a longer period, and till the age of 66. The glycosuric patients survived till 62, after $12\frac{1}{2}$ years of symptoms. In advanced cases, fatal signs are left-sided pleurisy, infarction, Cheyne-stokes breathing, gallop rhythm, and restlessness at night.

Hay,[45] writing on prognosis in *senile heart disease*, ascribes most importance to those symptoms (dyspnœa, pain, œdema) which indicate diminishing contractility ; and after these, to ventricular dilatation as a sign of lessened tonicity. The alternating pulse is rare, but grave. Extrasystoles are not important. Total irregularity is to be watched before a forecast is given, to see the extent of its influence on cardiac efficiency : the prognosis is best when its onset is insidious ; worst if it begins suddenly with symptoms of cardiac embarrassment.

Allyn[46] bases his prognostic statements on a perusal of sixty-three cases of *chronic valvular disease* seen in private practice. He considers that the outlook for women is better when the period of child-bearing is over. In rheumatic cases the chief danger lies in the frequency of relapse and recurrence ; this lessens with advancing age. Mitral stenosis always limits activity, and often kills before forty. Aortic valvular disease is less to be feared if of inflammatory than of arteriosclerotic origin ; in the latter type it is part of a progressive degeneration. Vertigo is a bad sign in aortic cases. He sums up his general experience by saying "that the prognosis of chronic valvular disease of the heart in private practice is much better, both as to duration and capacity for work, than most persons realize. It is no uncommon experience to find persons who have sustained these lesions for ten, fifteen, and twenty years, in some cases much longer, without either

great discomfort or great impairment of their activity. The patients who sustain these lesions longest and with least embarrassment are those of temperate habits and spare build, who do not easily become angered or worried, and who are controllable as to their mode of life and activities. Those who can lead a quiet, sheltered, protected life naturally live the longest. When death occurs it is usually the result of some accident or intercurrent disease, not directly from the heart. In estimating the prognosis in a particular case, one needs to keep in mind the distinction between a heart lesion and heart disease. As long as there is only a lesion the prognosis is good. A lesion ceases to exist and disease sets in when the heart enlarges and subjective symptoms appear. Subjective symptoms are better guides to the functional energy of the heart and to its lasting power than are objective signs. In angina pectoris the duration may be five years instead of the conventional one or two, just as some cases of aortic insufficiency may, under favourable conditions, last for thirty or forty years."

W. Broadbent,[47] writing of *aortic regurgitation*, says the prognosis is relatively good if the second sound is still heard in the carotids, if the lesion is endocarditic, the pulse not very collapsing, and ventricular enlargement only moderate. The supervention of aortic stenosis improves the prognosis.

PREVENTION.—Calwell[48] finds hope of preventing heart disease in thorough and early treatment of acute rheumatism, which, he says, is responsible for more than half of all cases of chronic heart disease. The destructive types of endocarditis will be prevented when we know more of the entrance-points of the infective agents. More accurate death registration would also help.

TREATMENT.—**Posture.**—Berg[49] advocates tilting of the patient's bed if œdema be present, to assist drainage through Southey's tubes. The legs of the bed nearest the patient's head are raised gradually to a maximum height of twenty-four inches from the floor. The hips should not be flexed, and the patient's feet must be supported against a well-padded rest, the head and shoulders being raised by pillows or a bed-rest. Huchard[50] considers that **Spa Treatment** is indicated in cardiac disorders under the following conditions. Post-rheumatic cases, if sent to a spa at all, must go where climate, altitude, and soil are beneficial to rheumatism. Arteriosclerotic disease may need treatment directed to renal elimination (e.g., Evian, Vittel); or lowering of peripheral resistance (CO_2 baths, as at Nauheim). He is emphatic as to the error of sending patients to Nauheim regardless of the nature of the cardiac disorder. Budinger[51] has devised an apparatus for the treatment of bed-ridden cardiac patients by **Passive Exercise** of the lower limbs. Renon[52] thinks we are rarely justified in forbidding a man to marry on account of cardiac disease. For women suffering from serious mitral stenosis, aortic disease, high tension, and pericardial adhesions, marriage is contraindicated on account of the risks involved in pregnancy.

Diet.—Goulston[53], and Sawyer[54] recommend **Cane Sugar** for the

various forms of myocardial insufficiency, ¼ to ½ lb. daily, a lump or two at odd times throughout the day.

Digitalis.—Careful investigation of the action and uses of this drug is one of the chief features of the year's work in cardiology. The first place must be given to Mackenzie's[55] characteristically thorough study. His work endorses Lewis's[56] suggestion, that the great indication for digitalis is the totally irregular pulse, and that in these cases it acts by depressing conductivity through the *a-v* bundle. Diuresis may be produced by the drug even when its effect on the heart is inconspicuous. Various individuals react very differently to it. Windle[57] gives detailed directions for its use in cases of total irregularity. It succeeds much better in the rheumatic than in the arteriosclerotic cases. In most instances it should be given for long periods interrupted by fixed intervals. The **B.P. Tincture** 15 min. four times daily is given till the pulse slows to fifty or sixty per minute (probably within a week); then it is to be given three times daily till the full effect is seen, either in the form of regular slowing or coupling of beats. The aim should be to keep the pulse at about fifty per minute, with due regard to its effect on other symptoms. Vomiting indicates its cessation, if the pulse is not slowed, the output of urine not increased, and dropsy not diminished. Bailey[58] thinks vomiting is a central effect and proves that the drug is being absorbed. He speaks of three stages of toxicity: (1) vagus stimulation, (2) depressed conductivity, (3) depressed contractility with increased irritability. Stages (1) and (2) may be so imperceptible that the stage of increased irritability (extrasystoles) is the first detected sign of poisoning.

Wenckebach[59] does not limit the use of digitalis to cases of total arrhythmia, but says "the many and varied properties of the drug oblige us to try it *prudently* in all cases where the heart is affected." Schmoll[60] states categorically that its use is indicated in the presence of signs of loss of tonicity (basic râles, hepatic enlargement, œdema of the ankles) in doses equal to its rate of excretion, i.e., about 0·1 gram per day.

One of the difficulties in treatment with digitalis is the *variability of preparations*. Ehlers[61] says this is due to the presence of enzymes, and accordingly recommends the use of Winckel's digitalis, which is enzyme-free. According to him, it has no bad by-effects, while it exercises the full digitalis action. Herz[62] says that the powdered leaves are the best preparation, but with two disadvantages—variability in the time of gathering, etc., and irritant action on the gastro-intestinal mucosa. The first drawback is overcome by the use of standardized preparations; and its irritative action is avoided by a preparation he has devised, in which the macerated leaves are incorporated with gelatin and dispensed as "digitalis jelly." Digipuratum is a physiologically standardized preparation made from the dried leaves with the superfluous matter removed. It is recommended from the clinical standpoint by Boos, Newburgh and Marks,[63] by Massalongo and Gasparini,[64] and by Veiel.[65] It appears to be harmless and to present

the desirable constituents in a convenient form (tablets, each of them equivalent to 0·1 gram of powdered leaves), and according to the Italian writers it may be safely used for hypodermic injection. It is interesting, and comforting to the ordinary mortal, to find that Mackenzie is satisfied with the B.P. tincture.

Hatcher and Bailey,[66] after extensive experimental work, decide that crystalline **Ouabain** (made from strophanthus) is to be commended above other digitalis bodies for intravenous use; but for the oral method, which will always be preferred for routine administration, a good tincture or infusion of digitalis is best. Stadelmann[67] finds ouabain useful for intramuscular injection, as it is painless; he has also given it by mouth in two-hourly doses of ·0004 gram with good results.

The impression left on the mind after reading all these papers is a conservative one, to the effect that digitalis is the best cardiac tonic for routine use. The B.P. tincture is a good preparation enough, but a word should also be said on behalf of Nativelle's digitalin. As to its clinical action, much remains to be discovered The clearest indication is auricular fibrillation.

Ulcerative Endocarditis.—Despite the increase in our knowledge of the bacteriology of the disease, we seem no nearer to a successful mode of treatment. True, Schiele and Dorbeck[68] report a case which they interpret plausibly as one of gonococcal following scarlatinal valvulitis, cured by treating the urethritis and administration of Parke-Davis' **Antigonococcus Serum** in three series of three doses each of 2 c.c. each. Henry[69] considers that the administration of a polyvalent pneumococcus vaccine was responsible for the recovery of a case of presumed pneumococcal endocarditis, though an autogenous (non-pneumococcal) vaccine had failed; and Emerson[70] records a "cure" of chronic streptococcal endocarditis under treatment with autogenous vaccines. Rosenow,[71] however, whose researches lend great weight to his opinion, does not think autogenous vaccine therapy is going to prove valuable. His observations lead him to the interesting conclusion that the endurance of bacteria in a destructive endocarditis is due to their immunization against the patient's antibodies. Hawthorne[72] says that as most cases of ulcerative endocarditis are streptococcal or staphylococcal, the best plan is to use **Polyvalent Antistreptococcus Serum** whenever the nature of the infection cannot be determined. This may conveniently be given per rectum. Sometimes this is effective, but the majority of cases are beyond our present means of cure. Hone[73] has found the polyvalent serum useless.

Cardiovascular Degeneration.—Mitchell Bruce[28] recommends that syphilitic cases be thoroughly treated with **Mercury** and **Potassium Iodide.** The glycosuric patients need dieting, graduated exercise, and a general reform in the way of living. If the patient be fit, **Spa Treatment** may be useful. He prescribes **Gregory's Mixture** and **Alkalies,** given before food, for two weeks, then adds **Arsenic** and **Nux Vomica.** In gouty patients **Potassium Iodide** is added to the Gregory

mixture, and regulations as to diet and exercise are insisted upon. When the circulatory disease is due to physical strain, the rule to be laid down is "live within your powers"; the diet must be of a non-flatulent order, and massage is recommended. Hay,[45] writing of similar cases under the title of the *senile heart*, lays down the rule that all things overtaxing the reserve power of the heart must be absolutely avoided. For the reduction of arterial pressure, **Dieting** and **Mercurial Purges** are more effective than nitrites. **Iodides** (of potassium or sodium) should be used; **Tinct. Iodi, Iodoglidine,** and **Iodipin** 25 per cent solution in milk) may also be used. If there is reason to suspect syphilis, **Mercury** should also be given. Obesity should be reduced by dieting, as far as possible. The patient should be re-assured as to the unimportance of *extrasystoles*, and exciting causes, alimentary and otherwise, should be looked for. If the disturbance is frequent and distressing, a mixture of **Hydrobromic Acid, Strychnine,** and **Infusion of Gentian** may be given. For the paroxysms of *total irregularity*, the patient must lie down; **Brandy** may be given, or **Menthol** with **Sp. Ammon. Aromat.** and **Sp. Chloroformi. Bromidia** is useful, and if the distress be great **Morphia** may be needed. For præcordial pain he recommends a **Mustard Plaster** applied locally. If the irregularity be persistent, special treatment should be withheld if possible, as even digitalis is disappointing (i.e., in the senile group as contrasted with the post-rheumatic types). Patients with symptoms foreshadowing failure of contractility must have sleep; the best drugs are **Chloral** with **Bromide, Veronal, Sulphonal,** and **Opium.** If, with these symptoms, the patient is active and restless, and the blood-pressure high, rest in bed for twelve hours out of the twenty-four must be enforced, and an occasional **Blue Pill** and saline draught prescribed, with a mixture containing **Ammonium Bromide** and **Arsenic** twice daily.

Aortic Regurgitation.—Broadbent[47] insists on the importance of salicylate treatment in the active phases of rheumatic valvulitis. **Aspirin** is specially mentioned. After the temperature is normal, **Potassium Iodide** is recommended. Rest in bed is necessary for six weeks after pyrexia has disappeared, and there must be no work undertaken for six months at least. Under such treatment the signs of aortic regurgitation may clear up.

Paroxysmal Tachycardia. — Baccelli[71] has found the intravenous injection of **Strophanthin** beneficial in preventing attacks. He gives doses of ·25 to 1 mgram daily over periods varying with the needs of the case.

Cardiac Emergencies.—Herz[75] says that the fear of sudden disaster is an important factor in the mind of the cardiopath. Part of the treatment lies in the eradication of this fear; but the doctor must always be ready for emergencies. For *cardiac asthma* **Morphia** is valuable, with **Caffeine, Black Coffee,** or **Alcohol.** If the right heart be greatly distended, **Venesection** is indicated. *Acute dilatation* with small rapid pulse is combated by intravenous injection of a cardiac

tonic (**Strophanthin, Digalen,** etc.), with vigorous hot friction of the skin. The same course is indicated in acute œdema of the lungs. (*See also* ANGINA.)

Cardiac Neurosis, **Adalin** recommended in (*page* 3).

REFERENCES.—[1]*Clin. Jour.* 1911, Feb. 1 and 8 ; [2]*Sem. Méd.* 1910, Dec. 28 ; [3]*Gaz. d. Osped.* 1910, Aug. 4 ; [4]*Münch. med. Woch.* 1910, 2487 ; [5]*Zent. f. Allgem. Path.* 1910, 439 ; [6]*Virch. Arch.* ccii, 107 ; [7]*Heart,* ii, 77 ; [8]*Quart. Jour. Med.* iv, 35 ; [9]*Heart,* ii, 241 ; [10]*Quart. Jour. Med.* iv, 498 ; [11]*Arch. Int. Med.* 1911, July ; [12]*Med. Rec.* 1911, ii, 109 ; [13]*Lancet,* 1911, i, 1638 ; [14]*Amer. Jour. Med. Sci.* 1911, i, 398 ; [15]*Quart. Jour. Med.* iv, 295 ; [16]*Heart,* ii, 127 ; [17]*Quart. Jour. Med.* v, 5 ; [18]*Deut. Arch. f. klin. Med.* 1910, Dec. 28 ; [19]*Münch. med. Woch.* 1911, 1945 ; [20]*Quart. Jour. Med.* iv, 55 ; [21]*Heart,* ii, 177 ; [22]*Quart. Jour. Med.* iv, 423 ; [23]*Lancet,* 1911, i, 922, 985 ; [24]*Amer. Jour. Med. Sci.* 1910, ii, 487 ; [25]*Heart,* ii, 222 ; [26]*Quart. Jour. Med.* iv, 145 ; [27]*Lancet,* 1911, ii, 69, 144, 205 ; [28]*Ibid.* 1202 ; [29]*Ibid.* 1260 ; [30]*Brit. Med. Jour.* 1911, i, 1364 ; [31]*Sem. Méd.* 1910, Oct. 12 ; [32]*Austral. Med. Gaz.* 1911, Jan. 30 ; [33]*Amer. Jour. Med. Sci.* 1911, i, 625 ; [34]*Virchow's Arch.* ccii, 1 ; [35]*Sem. Méd.* 1911, Feb. 8 ; [36]*Quart. Jour. Med.* iv, 283 ; [37]*Med. Rec.* 1910, ii, 1041 ; [38]"Mechanism of Heart Beat," London, 1911 ; [39]*Amer. Jour. Med. Sci.* 1910, ii, 408, 644 ; [40]*Johns Hop. Hosp. Bull.* 1910, 358 ; [41]*Deut. med. Woch.* 1910, Nov. 24 ; [42]*Deut. Arch. f. klin. Med.* ci, Pts. 1 and 2 ; [43]*Deut. med. Woch.* 1911, 1432 ; [44]*Münch. med. Woch.* 1911, 1561 ; [45]*Liver. Med.-Chir. Jour.* 1911, Jan. ; [46]*Amer. Jour. Med. Sci.* 1910, ii. 702 ; [47]*Lancet,* 1910, ii, 1413 ; [48]*Brit. Med. Jour.* 1911, i, 11 ; [49]*Med. Rec.* 1911, i, 609 ; [50]*Jour. des. Prat.* 1910, Sept. 3 ; [51]*Deut. Arch. f. klin. Med.* cii, Pts. 1 and 2 ; [52]*Med. Press,* 1911, 249 ; [53]*Brit. Med. Jour.* 1911, i, 615 ; [54]*Ibid.* 753 ; [55]*Heart,* ii, 273 ; [56]*Brit. Med. Jour.* 1910, ii, 1670 ; [57]*Ibid.* 1911, i, 423 ; [58]*Amer. Jour. Med. Sci.* 1911, ii, 183 ; [59]*Brit. Med. Jour.* 1910, ii, 1 ; [60]*Amer. Jour. Med. Sci.* 1911, i, 35 ; [61]*Wien. klin. Woch.* 1911, June 15 ; [62]*Ibid.* June 8 ; [63]*Arch. Int. Med.* 1911, Ap. ; [64]*Gaz. d. Osped.* 1911, 1003 ; [65]*Münch. med. Woch.* 1910, Sept. 27 ; [66]*Jour. Amer. Med. Assoc.* 1910, ii, 1697 ; [67]*Berl. klin. Woch.* 1911, May 15 ; [68]*S. Petersb. med. Woch.* 1910, Pt. 45 ; [69]*Pract.* 1911, i, 401 ; [70]*Jour. R.A.M.C.* 1910, 588 ; [71]*Jour. Amer. Med. Assoc.* 1910, ii, 1719 ; [72]*Pract.* 1911, i, 374 ; [73]*Austral. Med. Gaz.* 1910, Nov. 21 ; [74]*Sem. Méd.* 1910, Aug. 10 ; [75]*Prag. med. Woch.* 1910, No. 47.

HELMINTHOLOGY. (*See also* FÆCES.)

Leonard Rogers, M.D., F.R.C.P.

Maurice C. Hall[1] has studied the different methods of examining fæces for the presence of worms and their ova. The usual examination of smears only detects ova when they are numerous. They are more readily found either by examining the sediment after shaking up and decanting the fluid portion, or better still by centrifuging after separating the coarser fragments with a sieve. If, after obtaining a washed sediment, a solution of calcium chloride with a specific gravity of 1250 is added, the eggs rise to the surface and may be readily found either directly or by removing the surface fluid, diluting it again and centrifuging. After careful testing Hall has adopted the following method. After shaking up the entire sample of fæces in a bottle three-quarters full of water to break up the fæcal masses, it is passed through a series of six sieves with meshes ranging from 3 mm. to one-fourth of a millimetre, and finally through a screen of miller's silk bolting-cloth with a mesh of about 0·125 mm. What passes through should then be sedimented, and centrifuged for a few

seconds only. Calcium chloride (1250 sp. gr.) may be added to one tube to float up the ova, and the surface fluid examined. By this method all ova are found readily, while the first sieve will retain any actual worms, which are found in the usual way by washing in a porcelain or other white dish.

H. Wolferstan Thomas[2] records a pathological report on a case of *œsophagostomiasis* in man, in which the patient died of septic peritonitis due to the lesions produced in the intestines. The paper is well illustrated with coloured plates. R. T. Leiper[3] also notes the discovery of *œsophagostomum apiostomum* in human intestinal contents, while examining specimens from Nigeria for ankylostoma. No notes of the case were available. This parasite had already been known to produce serious intestinal lesions in monkeys.

REFERENCES.—[1]*Jour. Trop. Med. and Hyg.* 1911, June 1; [2]*Ann. Trop. Med.* 1910, June; [3]*Jour. Trop. Med. and Hyg.* 1911, 116.

HERNIA. *John B. Deaver, M.D.* / *D. B. Pfeiffer, M.D.* } *Philadelphia.*

Scudder[1] reports the *results of operation* in 168 cases that could be traced. In all he had performed 244 operations for herniæ of all kinds. The only deaths were in cases of strangulation, of which there were 25 with 10 deaths. In 109 cases of *inguinal hernia* in which the results were known, there were 10 recurrences, and 90·9 per cent cured. The **Bassini Operation** was employed. In 16 traced cases of *ventral hernia* there was one recurrence. There were 13 cases of *umbilical hernia*. There was no report from 3 cases. Of the remainder, 5 died of strangulation, 5 had no recurrence. There were 5 patients with *epigastric herniæ*, all of whom remained well.

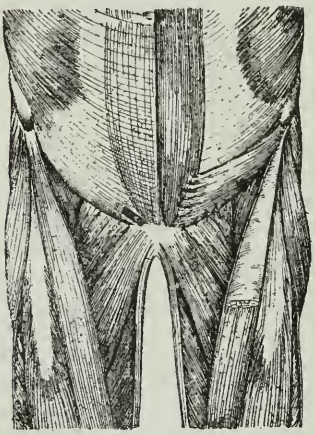

Fig. 83.—Plastic operation for inguinal hernia, using sartorius muscle.

Of the 10 *recurrences in inguinal herniæ*, two were in patients who were subject to chronic cough; one was in a strangulated hernia where haste was necessary. No causes could be assigned for the remaining seven. On the basis of this experience, Scudder is well satisfied with the Bassini operation.

In cases of deficient musculature and in certain recurrent *inguinal hernias*, Mantelli[2] proposes to use a portion of the **Sartorius** to reinforce the abdominal wall. The method of doing this is easily understood from the illustration (*Fig.* 83).

A suggestion for the strengthening of the closure of *femoral hernias* comes from Wilms,[3] who proposes to employ a portion of the **Fascia**

Lata to cover the defect. The illustrations (*Figs.* 84, 85) show this method, and in eight cases it has been successfully employed.

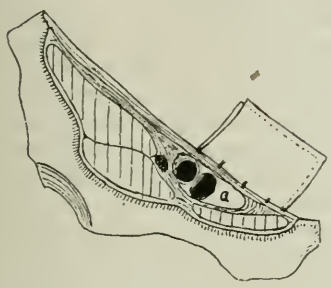

Fig. 84.—Double fascial flap directed upwards. A = crural canal, to be closed by the flap.

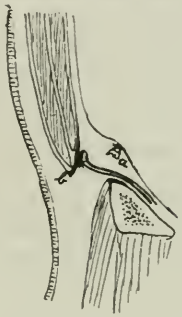

Fig. 85.—Fascial flap stretching from Poupart's ligament (*b*) to posterior aspect of os pubis. A = hernial sac, tied off.

Sick[4] has proposed a somewhat similar method of reinforcing the closure of a femoral hernia by turning back a portion of the **Pectineus Muscle** and **Fascia.** In sagittal section the effect is as seen below (*Fig.* 86).

Wiener[5] condemns the use of chromic catgut as a suture material for the repair of hernias. From his observation he has concluded that a large percentage of recurrences are due to its use, owing to slipping of knots or weakness of the material. He favours the use of **Pagenstecher Linen** as a routine suture, and **Silver Wire** in some form in many recurrent cases, and in primary operations where the tissues are poorly developed. It has been necessary to remove these sutures on account of suppuration only once in upwards of one hundred cases. Some very good results are reported from the use of the silver filigree in the case of large and recurrent hernias. The wire should be thin, not heavier than size No. 30. Very thin wire twisted in the form of a cable possesses marked advantage over heavy wire. It is more pliable, can be tied into a knot with ease, bends readily with the movements of the body, and is not apt to cause irritation. In very poorly developed walls it is well to place two filigrees superimposed at different levels. As to the indications for its use, he quotes McGavin, who employs it in old people with large hernial openings, in people who habitually throw an extra strain on their abdominal muscles, in patients with poorly developed

Fig. 86.

(1) Skin and subcutaneous tissue. (2) Abdominal muscles with the stump of the perineal sac and musculo-fascial layer fixed by sutures. The free fascial edge is Poupart's ligament. (3) Peritoneum with stump of sac. (4) Flap of pectineus. (5) Pubic bone. (6) Pectineus and adductor magnus. (7) Fascia lata-pectineus (may be absent).

abdominal muscles, and finally in recurrent hernias. To these groups of cases another is added, in which the muscles and fascia cannot be approximated without tension. (See *Medical Annual*, 1911, p. 384.)

Strangulated Hernia.—Connor[6] reports eighty-five consecutive cases of strangulated hernia with a mortality of 17·6 per cent. Eighty-two were inguinal hernias and only three femoral. The more voluminous and freely movable cæcum of the Indian is more likely to stray into a hernial sac than is that of the European. In two cases, on drawing down the bowel above the constriction, a second loop of strangulated bowel was discovered. This illustrates the importance of investigating the condition of the bowel immediately above the internal ring, and adds point to the communication of Miller,[7] noticed below.

Three cases of *strangulated epigastric hernia* are reported by Ridgway,[8] with recovery in each case. In two of the cases, the bowel which had prolapsed was the transverse colon, a fortunate fact for the prognosis, since it is well known that the higher in the bowel is the obstruction the more rapid and severe are the symptoms. Thus, strangulated umbilical and epigastric hernia would presumably be more dangerous

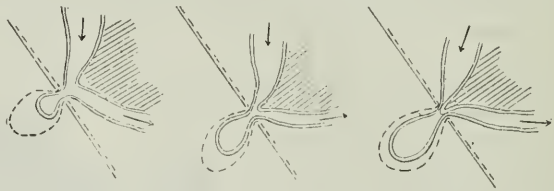

Fig. 87.—Three intestinal herniæ: bowel strangulated for one-third of its circumference, for two-thirds, and up to the insertion of the mesentery. Dotted line represents peritoneum.

than the hernias of the lower abdomen. Scudder had five deaths in ten cases of strangulated umbilical hernia. The experimental work of Maury on the cause of death in high obstruction of the bowel is interesting in this connection, and was noticed in last year's *Annual*.

Connor notes as an unusual condition among his series of strangulated hernia, the occurrence of a *Richter's hernia*, which led to a scrotal abscess by extension of the infection downwards. While the complication was indeed unusual, the primary condition, as Hiedel[9] points out, is not so uncommon as generally believed, and the failure to recognize a condition so dangerous to life is to be found in the lack of appreciation of this fact. His own statistics of this condition in 550 cases work out at 11·5 per cent.

The ease of diagnosis is affected by the size of the segment of bowel wall which is snared by the hernial ring. At times only a third of the circumference of the bowel is strangulated, more often two-thirds, and often enough the constriction may comprise all the bowel up to the mesenteric border, as illustrated by the accompanying schematic sketch (*Fig.* 87).

The clinical manifestations of this form of hernia are usually as

distinct as in strangulation of the entire intestine, because commonly two-thirds or more of the intestine are incarcerated. The majority of cases suffer from vomiting, and inability to pass fæces or gas. Visible peristalsis is present. The minority show less disturbance. The abdomen is less distended, the patient may pass fæcal material and gas, and no vomiting occur. All have pain at the site of obstruction. The pain, however, is subjectively borne very differently. Stoical individuals accustomed to enduring minor ills without complaint or seeking advice, may not consult a physician at all. This is unfortunate, for it is the less severe cases which are made most dangerous thereby. To avoid overlooking this condition, Riedel counsels that in every small tumour below Poupart's ligament or in the region of the inguinal canal, or distal to this, one should consider the possibility of Richter's hernia if any intestinal symptoms be present.

The treatment of this form of hernia is always operative. Any attempt at reposition is contraindicated.

An interesting and important condition is that treated by Miller[7] in an article on the *coincidence of volvulus with real or simulated strangulated hernia*. The dominant feature is always acute intestinal obstruction. Strangulated hernia may be complicated by volvulus of an intra-abdominal oral loop.; there may be a volvulus, one loop of which finds its way into the hernial sac to become incarcerated and simulate strangulation, or to become actually strangulated ; or, again, the torsion may occur within or just above the neck of the sac, when both factors may contribute simultaneously to the production of strangulation within the hernia sac. The group thus presents a complicated picture. Knaggs, in 1900, proposed four groups, viz. :— Group I : Volvulus of a portion or all of the herniated bowel ; Group II : Volvulus of the small bowel, one loop of which becomes herniated ; Group V : Volvulus of the herniated bowel immediately after its reduction ; Group VI : Volvulus of the herniated bowel long after its reduction. Two additional groups must now be added, viz. :—Group III : Volvulus of a distant oral loop above an actually strangulated hernia ; Group IV: Volvulus, generally of the large bowel, distal to a simulated strangulated hernia. With two cases of his own, Miller reports seventeen collected instances of Group I., twelve of Group II., five of Group III., three of Group IV., and refers to two cases each of Groups V. and VI ? reported by Knaggs.

The mechanism of the production of the various types is discussed and the following conclusions are appended: (1) Volvulus may produce in a hernia signs and symptoms which accurately simulate hernia strangulation ; or it may be associated with actual strangulated hernia. (2) Volvulus, in either association, may readily escape recognition ; it is probably contributing heavily to the mortality of strangulated hernia. (3) The diagnosis before operation is usually exceedingly difficult ; suggestive features are, advanced age, the presence of a hernia for many years, shock out of proportion to the signs about the rupture, and marked abdominal pain and tenderness,

with occasionally a palpable mass. (4) An operation undertaken for strangulated hernia must demonstrate absolutely the strangulation. (5) Volvulus proximal to actual strangulated hernia apparently offers no sure means of diagnosis other than routine abdominal exploration —a procedure manifestly not to be recommended.

A disagreeable complication of attempts to reduce strangulated hernia by taxis is separation of the friable mesentery from the bowel. A few cases have been reported. Resection is usually necessary, and the prognosis is grave. Contributions have been made to the subject by Guibé[10] and by Rabere and Charbonnel.[11]

References.—[1]*Bost. Med. and Surg. Jour.* 1910, ii, 343; [2]*Gaz. d. Osped.* 1910, Nov. 22; [3]*Münch. med. Woch.* 1911, Feb. 7; [4]*Ibid.* 1911, 1003; [5]*Ann. Surg.* 1910, ii, 678; [6]*Ind. Med. Gaz.* 1910, 447; [7]*Ann. Surg.* 1911, i, 232; [8]*Brit. Med. Jour.* 1910, Dec. 17; [9]*Deut. med. Woch.* 1910, 2417; [10]*Rev. d Chir.* 1910 Sept.; [11]*Ibid.* Oct.;

HEROINOMANIA. (*See* Narcomania.)

HERPES ZOSTER, GENERALIZED. *E. Graham Little, M.D., F.R.C.P.*

Nobl[1] reports a very striking case of bilateral herpes zoster, in a man, aged seventy-four, distributed on the face, neck, back, abdomen, loins, breast, penis, and thigh; the vesicles were about the size of small shot, surrounded by an erythematous areola, often with hæmorrhagic centre; there were also some erythematous papules, not vesicating, and a few dried-up necrotic ulcers. On the forehead, chest, genitals, and loins there were some gangrenous areas. The axillary glands were not tender. There were no visceral changes; the vessels were sclerosed. The urine showed presence of albumin and indican; the sediment contained oxalate of lime. There was severe neuralgia, and moderate leucocytosis and eosinophilia (6 per cent). The eruption disappeared in about a fortnight. The temperature was normal throughout.

Reference.—[1]*Wien. klin. Woch.* 1911, 14.

HIP-JOINT DISEASE. (*See* Joints.)

HYDATIDS, PULMONARY. *J. J. Perkins, M.B., F.R.C.P.*

Bird[1] calls attention to the value of *x*-rays in the *diagnosis* of hydatid of the lung, especially before rupture has occurred. In fact, he says that with the aid of the screen it is impossible to avoid the diagnosis in the case of an unruptured hydatid. In contrast with the transparent lung, the hydatid cyst throws a darker shadow, on account of the obstruction to the rays by virtue of its saline contents, and not, as might be expected, by its membrane. The absence of a fibrous adventitia, which is the rule where the lung is the seat of a hydatid tumour, and the transradiance of the cyst wall itself, make the usefulness of the screen much less in cases where the hydatid has ruptured, though even here valuable help can be gained in most cases from this method. Apparently, a shadow from a small portion of the circum-

ference of a cavity in juxtaposition with a hypertransradiant area is evidence of value. Nor is the value of radioscopy limited to the bare diagnosis. By the aid of the screen, the surgeon can locate the exact position of the cyst, whether nearer the back than the front or whether impinging on the parietes. In addition, the difficult question of whether a hydatid arises from the liver and pushes the diaphragm up, or whether it is really lying in the lung or lower portion of the pleura, has never received a satisfactory answer until the introduction of this method. The complication of a hydatid by a pleural effusion is the one condition which resists this mode of diagnosis.

In his remarks on the **Surgical Treatment** of hydatid, which he considers essential before rupture, he makes one very interesting point. The expansion of the lung after removal of the cyst is so quick that the space previously occupied by the hydatid is almost immediately obliterated, and therefore nothing further is needed than the complete sewing-up of the wound ; only if there is a thick adventitia preventing the closing of the cavity should drainage be resorted to, and then only for a few days.

Howard[2] confirms Bird's opinion of the value of radioscopy, especially in the diagnosis of a hydatid of the liver from one in the base of the lung. The spherical outline shown by most hydatid tumours is a great help in their diagnosis from a simple pleural effusion. It has frequently happened that a hydatid mistaken for a pleural effusion and tapped in the ordinary way, has ruptured and proved fatal to the patient, who is practically drowned in the fluid contents. This danger can now be avoided by the use of radioscopy, though it is only fair to say that Cooke[3] considers **Aspiration** of a hydatid perfectly safe provided a fine needle (about 1 mm. in diameter) is used for the purpose ; where this precaution has been taken he has never seen any untoward result. It is evident from the writings of the Australian physicians that the differential diagnosis between hydatid and pulmonary tuberculosis is very difficult, not of course where the hydatid ruptures, and there is, as is then the rule, abundant expectoration, but before rupture in the case of small deep-seated tumours. Dullness at one apex may then be the only physical sign, while the symptoms may be virtually the same for the two conditions, hæmoptysis and irritating cough being common to the two, while emaciation may be marked in either. Eosinophilia is more often absent than present, and the *x*-rays afford the only means of arriving at a correct diagnosis.

REFERENCES.—[1]*Austral. Med. Jour.* 1911, Feb. 20 ; [2]*Ibid* ; [3]*Ibid.*

HYDROCELE. *Priestley Leech, M.D., F.R.C.S.*

Whitney[1] recommends the insertion of **Sterile Catgut** into the sac of the hydrocele where operation is declined. He says it is less toxic than the injection of carbolic, less painful than iodine, and more certain than either. The method is as follows : With the patient lying on the operating-table, the hydrocele is made tense, and is then tapped with a trocar and cannula ; the trocar is withdrawn, and catgut in 8-inch

lengths is introduced through the cannula into the sac before the fluid escapes. The gut must be pushed in quickly, or it softens. He found chromicized catgut the best, and usually about sixteen inches are used. The sac swells and becomes inflamed and tender, but about the fourth day the inflammation begins to subside and the fluid is gradually absorbed. Four to six weeks are usually required for a cure.

REFERENCE.—[1]*Boston Med. and Surg. Jour.* 1911, ii. 204.

HYDROCEPHALUS. (*See* BRAIN.)

HYPERIDROSIS. *E. Graham Little, M.D., F.R.C.P.*

Pirie[1] has had several successes with *x*-ray treatment for this condition in the axillæ, hands, and feet. From three to six exposures to each site have been usually required at intervals of about a month. The relief seems permanent, and probably depends on an actual arrest of secretion by destruction of the sweat glands. Meachen[2] has some useful formulæ:—

For *Sweating Feet.*—Bathe the feet well every night with a warm 1 per cent solution of **Permanganate of Potash**; dry thoroughly. The next morning dust on the following powder:—

℞ Pot. Permang. ℥ij | Zinci Carb.
Pulv. Alum. Opt. gr. xx | Zinci Oxidi āā ℥ss
Talc. Pulv. ℥j |
Misce. Fiat pulv.

For *Sweating Hands.*—Bathe with one of the following lotions twice or thrice daily:—

℞ Tannin ℥j | Spt. Rect. ℥vj
Eau de Cologne ℥ij | Aq. ad ℥viij
Misce. Fiat lotio.

℞ Quin. Sulph. ℥j | Aq. Rosæ ad ℥j
Spt. Rectif. ℥vj |
Misce. Fiat lotio.

After which a little **Tannoform** may be applied and the hands rubbed dry with a towel.

For *Sweating of the Axillæ.*—The armpits may be bathed with weak **Vinegar** in the mildest cases, after which the following dusting-powder may be applied on a pad of plain gauze:—

℞ Acid. Salicyl. gr. xx | Pulv. Aluminis ad ℥iss
Pulv. Amyli Opt. ℥ij |
Misce. Fiat pulv.

In other cases **Lysoform** lotion (½ to 5 per cent twice a day) may be tried, or the naphthol-glycerin lotion, much recommended by Brocq, thus:—

℞ β-naphthol ℥j | Spt. Vini Rect. ad iiss
Glycerini ℥ij |
Misce. Fiat lotio.

REFERENCES.—[1]*Lancet*, 1911, ii, 433; [2]*Pract.* 1911, i, 589.

HYPERMETROPIA. (*See* REFRACTION, ERRORS OF.)

HYPOPYON ULCER.

(*Vol.* 1911, *p.* 304)—The best form of treatment, according to Mackenzie Davidson, is that by Radium.

IMPETIGO CONTAGIOSA. *E. Graham Little, M.D., F.R.C.P.*

Magill[1] advocates treatment of impetigo contagiosa by directing a continuous stream of warm **Normal Saline Solution** for several hours over the surface affected. By this means scabs are quickly removed, and healing takes place rapidly. Care must be taken to prevent reinfection.

Montgomery[2] found the following paste useful in obstinate impetigo of the mucous membrane, especially about the eyelids.

R	Amyli	25	Naftalan	50
	Zinci Oxidi	25		

To be used at night and wiped off with olive oil in morning.

REFERENCES.—[1]*Hosp.* 1910, Oct. 1; [2]*Jour. Cutan. Dis.* 1910, 445.

INEBRIETY. (*See* ALCOHOLISM.)

INFANT FEEDING. *G. F. Still, M.D., F.R.C.P.*

Breast Feeding.—Southworth[1] emphasizes the importance of breast feeding as a means of reducing infantile mortality, and points out that in the first few weeks of life a stationary weight is a far more serious matter than at any subsequent age. Moreover, the worst type of marasmus is seen in those infants who have not received breast milk during the first few weeks of life. If the weight is stationary, the result may be not merely delayed progress, but actual loss of assimilative power; even if only partial breast feeding is possible, the gain to the infant is very great. He says it is a common mistake to regard the mucoid and somewhat frequent stools, varying in hue from dark green to golden brown, and containing but little fæcal residue of milk, as due to digestive disturbance, for they are in reality the stool of a relative starvation, and indicate a scanty intake of breast milk. Under these conditions it is often only necessary to make some very small addition to the food; sometimes even as little as $\frac{1}{2}$ oz. of barley-water given before or after the breast milk, has started a gain in weight.

Southworth is in favour of complemental feedings of half to one ounce, as larger amounts may result in over-distention of the stomach, and mentions as suitable material barley-water, whey, or one of the proprietary combinations of maltose, dextrose, and dried milk.

Pritchard, Carter and Pitt[2] consider that great assistance may be obtained by "test feeds," i.e., weighing the infant before and after feeding. Infants are often treated by drugs for constipation, when the sole cause of the condition is starvation, and an infant who has been obtaining only about one ounce from the breast is often put upon 4 or 5 oz. of cow's milk as supplementary feeds, with the result that this unaccustomed amount upsets the digestion. At the time

of weaning, similarly, a valuable guide may be obtained by ascertaining how much the child has been accustomed to take from the breast.

The number of mothers capable of suckling their infants is diminishing under the conditions of modern over-civilization. Findlay[3] quotes Holt as finding that only one out of every four in the upper classes is capable of performing this duty even for a limited time. The upper-class mother who can suckle her infant for nine months has become almost a curiosity. Findlay himself found amongst the poorer classes of Glasgow that over 90 per cent had sufficient milk for the first month, and 69·5 per cent suckled their infants for at least six months. In only 8 per cent was the cause of weaning before six months actual deficiency of milk. He raises the question, How long can lactation continue with benefit to the child and without injury to the mother ? and quotes the case of a wet nurse in Finkelstein's clinic who continued suckling for two years, but such an exceptional case can hardly influence the general conclusion of experience, that breast feeding prolonged beyond the ninth month by the modern mother—a different creature from the rough, almost animal type, so often met with amongst wet nurses—is a cause of rickets in the child.

That mother's milk is not an infallible success in infant feeding must be a familiar fact to all who see much of infants. In some cases the failure of human milk depends upon demonstrable abnormalities in the proportions of fat or casein, very rarely upon variations in the sugar. Maloney[4] found that diarrhœa was often dependent upon excess of fat in the breast milk, e.g., 4·5 to 6 per cent. He also traced eczema in nurslings to richness of the milk in sugar or to over-feeding. He does not, however, seem to attach importance to the salts of milk, differing herein from the observations quoted by Findlay (loc. cit.) from Meyer, who separated the curd from the whey in both human and cow's milk, and mixed the curd of the former with the whey of the latter, and vice versa. He found that the curd of cow's milk was digested with ease when mixed with the whey of human milk, whereas the human curd mixed with cow's milk whey gave rise to digestive disturbances like those produced by ordinary cow's milk.

Hand Feeding : "Casein Milk."—The problem of artificial feeding of infants remains as complicated as ever, one of the latest additions to the methods of hand feeding is the use of so-called **Albumin Milk,** the "Eiweiss Milch" of Finkelstein and Meyer. The former of these holds that milk sugar is a much commoner source of indigestion in infants than fat or casein. The latter, according to Leopold,[5] has no more ill effect upon infants than plain water ; indeed, it tends to neutralize the fermentation processes caused by the sugars, and for this reason has a certain curative action in intestinal disturbances. These statements are based upon experimental observations with the sugars and with the salts of milk, the latter also being found a disturbing element for the digestive processes in some cases.

This "Eiweiss Milk," albumin milk, or casein milk, is prepared, according to Abt,[6] as follows. One tablespoonful of essence of pepsin

is added to a quart of milk (any of the various rennet preparations commonly used for making whey will do); the milk is then stood in hot water, so as to heat it to about 100° F. After the milk has curdled it is allowed to stand for fifteen minutes longer, and the whey is then poured off. The curd or junket is then put into a clean muslin or cheese-cloth bag, tied at the top, hung up, and allowed to drip for two hours, after which the junket is found to be free from whey. This curd is then placed in a hair sieve and gently broken up with a potato masher, and enough boiled water is added little by little to make a pint. The mixture thus strained through the sieve should be passed through six or seven times until the mixture is perfectly smooth and free from lumps, after which one pint of previously-boiled buttermilk and one per cent of malt sugar in some form is added, when the preparation is ready for bottling. Leopold states that the buttermilk is added partly as containing a small amount of milk sugar, and partly on account of the lactic acid which it contains. It has also the advantage that it can be kept for a long time. The composition of this casein milk is stated to be proteid 3 per cent, fats 2·5 per cent, sugar 1·5 per cent, salts 0·5 per cent. In cases of intestinal disturbance there is usually a loss of weight during the first few days that this food is given, but the stools improve, and the temperature falls to normal. As soon as the stools have become natural, sugar, preferably maltose, should be added to the feeds in the proportion of ½ to 1 oz. to the entire day's food. Abt, however, says that at first it is safer to add saccharin, not as of any value for nutrition, but to make the food more acceptable to the infant; later, malt sugar may be added, but at no time more than 4 per cent. For children over three months, the addition of starch in the form of flour is sometimes advisable, 2 or 3 dr. being added to the entire day's feed. In some cases the stools become frequent and loose; but Abt is strongly in favour of persisting with the albumin milk without alteration of quantities, as the stools will, after a short time, right themselves. In any case, the entire quantity of albumin milk given in the day should not exceed thirty-five ounces.

The results of feeding with this mixture, as recommended by Finkelstein, are described as "brilliant"; but already careful observations by other physicians throw doubt upon the *rationale*, as well as upon the general success, of this method of feeding. Chapin[7] reports tabulated statistics of infants treated thus, and concludes that the results were not very promising, the benefits which follow in some cases being due more to fine division of curd than to diminution of sugar in the mixture. He thinks it may check the rapidity of atrophy temporarily, and may thus have a restricted usefulness; and that in certain forms of diarrhœa also it may be beneficial.

Soluble Milk Albumin. — Snowman[8] points out that the generally recognized digestibility of the soluble albumin of milk, "lactalbumin," has led hitherto to the use of whey mixtures where there was difficulty in digestion of curd; and that experience shows the frequent failure of these whey foods, which, according to the recent work of Finkelstein

and Meyer, probably depends upon the sugar and salts which are present in the whey in association with the soluble albumin. It is desirable, therefore, to obtain the albumin free from these. The substance sold as "**Albulactin**" is supposed to supply this want. Snowman even goes further, and seems to imply that if a larger proportion of proteid than usual can be given in digestible form, as is claimed to be the case when albulactin is added to a milk mixture, deficiency of fat becomes less harmful. Toogood[9] also reports good results from the use of this preparation. He is of opinion that the increase in weight which sometimes follows its use is more than can be accounted for by the amount of albumin given, and ascribes it to improvement in the power of digestion.

Fat in Cow's Milk.—The fat of human milk, as Snowman points out, is comparatively rich in olein, an easily-digested substance; whereas cow's milk fat contains chiefly stearin and palmitin, which are much more difficult of digestion. This alone may account for the fact, now generally recognized, that the simple rectification of the fat deficiency in diluted cow's milk up to the standard of human milk, by the addition of cream, is very frequently a disastrous failure. The tendency in recent years is rather towards a percentage of fat considerably lower than that present in human milk. Douglas[10] says that in his experience infants digest fat better during the first few weeks of life than in later months, and that very few will at any time digest more than 2 per cent (a statement hardly in accord with general experience). He points out that overfeeding with fat, as with any other constituent of milk, very soon diminishes or destroys the power to digest that constituent, and that where too high a proportion of fat has habitually been given it is often necessary to reduce the amount to an abnormally low figure, e.g., 1 per cent. He points out also that it is a mistake to make any considerable increase in the proportion of fat for its laxative effect; if an increase of ·5 to 1 per cent does not act on the bowels, further increase is only likely to produce dry, crumbling, constipated stools. It is extremely important to recognize early the symptoms of fat indigestion, namely variable and diminished appetite, flatulence, disturbed sleep, yellowish pallor, a tendency to vomit about half an hour after a feed, pale, dry, offensive stools, and the failure of the infant to grow. The difficulty in the digestion of fats may continue when the infant grows older, and show itself in inability to digest the yolk of egg, the fat of oatmeal, or the fat of cod-liver oil.

With this last view Vogt[11] entirely disagrees. He points out that the child who does not tolerate fat introduced in the form of milk often takes it perfectly in the form of cod-liver oil, and is immensely benefited by it. This observer emphasizes the harmful effects of excessive milk, one of which, constipation, may sometimes be relieved in the case of older children by giving them no milk at all.

An exclusive or almost exclusive diet of milk up to the end of the first year, or even in the second year, is generally associated with pronounced pallor of the child, an anæmia resulting from diminution

in the number of the red corpuscles and in the percentage of the hæmoglobin; sometimes, also, there is some enlargement of the spleen, which gradually disappears when the quantity of milk is reduced.

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INFLUENZA.

(*Vol.* 1910, *p.* 390)—For simple cases the following mixture may be given: Sodii Salicylat., Potass. Bicarb., āā gr. x, Liq. Ammon. Acet. ℥j, Ammon. Carb. gr. iij, Aq. Chlorof. ad ℥ss; every 4 hours.

INSANITY. (*See also* ALCOHOLISM *and* NARCOMANIA.)

Norah Kemp, M.B., C.M.

Heredity.—Mott[1] deals with the question of heredity and insanity in regard to its social and economical aspects as affecting civilized humanity. Natural selection and survival of the fittest, together with the constant tendency to regression to the normal average of the race, he says, are the factors preventing such conditions as congenital defects, abnormalities, and diseases becoming general, even if transmitted through many generations. The struggle for existence has prevented the perpetuation of the poor types in man, and for this struggle the evolution of the mental attributes has been essential. The great centres of civilization and human progress have been built up where nature has provided a great store of energy for the use of man, and there the struggle has been greatest. Wherever large numbers are gathered together they are apt to be devastated by epidemic diseases, many of which are filth-begotten; and consequently those who survive are the most intelligent and cleanly in their habits.

By his discovery of the causes and prevention of disease, and by his use of the forces of nature, man has interfered with nature's methods of extermination of the unfit, and unless perpetuation and multiplication of the poor types can be prevented, racial degeneration will follow. This applies specially to the mentally defective. Remarkable instances of the evil inheritance of two women are mentioned. One is a case recorded by Professor Poelmann, of Bonn. She was a confirmed drunkard, and the direct ancestor of 834 persons; of these, 700 were known: 157 were illegitimate, 162 professional paupers, 64 were paupers, 181 women on the streets, 7 were condemned to death for murder, and 76 convicted of lesser crimes. The other woman was Ada Juke, the "mother of criminals," who left 1200 direct descendants, of whom nearly 1000 were criminals, paupers, inebriates, insane, or on the streets. This inheritance cost the State £260,000.

Alcoholism and Insanity. — He does not consider alcohol to be a cause so much as a co-efficient in most cases, the real cause being an inherited potential mental instability. In support of this argument, Mott compares the results of 2,000 post-mortem examinations made at Charing Cross Hospital with those of his asylum expe-

rience. Among the 2,000 there were 110 cases of advanced cirrhosis of the liver, with dropsy in 60 per cent, and with a history of prolonged alcoholic indulgence. In the asylum autopsies there were, contrary to his expectations when alcohol had been stated to be the cause of the insanity, relatively very few cases of cirrhosis of the liver, and only one case so far advanced as to be accompanied by dropsy. He met with very few cases of alcoholic dementia of a permanent nature.

He refers to the regional dissociation of insanity and drink which has been pointed out by Bevan Lewis, P. W. Macdonald, and W. C. Sullivan, and mentions that drink and crime are comparatively rare among Quakers and Jews, but insanity is prevalent. In Colney Hatch Asylum there are 500 Jews and 2,000 Christian patients, and heredity is a more important factor among the former than among the latter. He has observed that a quantity of alcohol consumed daily by a man of inherited sound mind without apparent harm is sufficient to make a potential lunatic certifiable or anti social, and it follows therefore that alcohol acts as an eliminator of the unstable, the defective, and those who lack control of the animal passions.

He finds no proof that the drink habit is transmitted to the offspring, but weak will power and lack of moral sense may be inherited, whereby they cannot resist the temptation to drink. (*See also* ALCOHOLISM.)

Tuberculosis is very prone to affect the insane, especially those suffering from imbecility, adolescent insanity, and melancholia, due in part to an inherent nutritional deficiency—a failure to assimilate food. The death-rate from pulmonary tuberculosis for the insane between the ages of fifteen and twenty-five is about fifteen times that of the sane for the same age period. During the last thirty years there has been a decline in the death-rate from tuberculosis, but there has been no corresponding decline in the number of lunatics and feeble-minded, which one would naturally expect, were tuberculosis one of the principal causes of insanity.

How is society affected by the presence of the insane? Low-grade imbeciles and idiots are born as a rule with insufficient and inefficient neurons connected with the higher functions of the mind, a condition which is unalterable. This lack of mind may show itself in different degrees: for example, the microcephalic and sometimes the hydrocephalic idiot, in whom only the animal instincts are retained; and the low-grade and the high-grade imbecile, both of whom may also be epileptic or criminal. From a racial point of view the high-grade imbeciles are the more dangerous, because they are not segregated, and so may breed criminals, lunatics, drunkards, and the unemployable.

Some *geniuses* have been insane, or have had insane parents; but Mott agrees with Maudsley that the genius which is closely allied to madness is of an inferior order: intense, narrow, hysterical, and explosive; not calm, large, whole, and constructive. The tendency to suicide is often inherited, and there are remarkable records of families where members in successive generations have taken their lives in a particular way, and sometimes even at a particular age. Morel men-

tions an instance where seven brothers destroyed themselves, though in good positions and suffering from no misfortune.

In discussing the question of *consanguinity* and degeneracy, the effect of this is shown in some of the royal families, and the Cæsars; and especially the Spanish succession, where an hereditary neurosis followed a family for 350 years.

From the investigation of relatives in the London County Asylums, Mott discovered that certain forms of insanity are especially liable to be transmitted to the offspring. He found that in acquired conditions such as general paralysis of the insane, brain softening from arterial disease, general arteriosclerosis, alcoholic psychosis with dementia, lead encephalitis, tumours, and senility, heredity plays a smaller part. In the 20,000 patients of the London County Asylums, 700 were paternally or fraternally related to one another.

The *law of anticipation* in the insane is next dealt with, according to which insanity, when transmitted, occurs at an earlier age in each successive generation. Of 420 pairs of parents and offspring, 51 per cent of the offspring were found to have had their first attack of insanity before the age of twenty-five, a considerable proportion being congenital imbeciles. Mothers transmit much more frequently than fathers; and daughters are affected more often than sons; also the offspring are affected at about half the age of the parent, being in most instances either congenital imbeciles or cases of adolescent insanity. Similar inheritance was very striking in recurrent periodic insanity and in paranoia. The study of pedigrees reveals the differences of manifestation of a neuropathic taint. In some members of the tainted stock it may appear as chorea, epilepsy, migraine, neurasthenia, exophthalmic goitre, or diabetes; in others, it may be a matter of temperament, eccentricity, exaltation, melancholy, feeble will power, etc. According to Savage,[2] a neurotic inheritance is liable to bring about the establishment of certain morbid mental habits, and where such an inheritance is strong there is great risk of the development of organized delusions. Proper care may keep these latter tendencies in check, but an improper environment in which there is temptation to drink, evil companions, etc., may result in insanity, crime, or suicide. In a third generation these inborn tendencies may appear in a more intensive form, resulting in congenital imbecility and feeble-mindedness. Mott has found this to be the case when two first cousins, not insane but coming of a tainted stock, have married.

Alterations in the blood and lymph which nourish the germ cell may have an influence on the germinal determinants, and may account for variations in a family tainted with insanity, so that some are deeply affected and some altogether escape. Those affected may show degeneracy at birth, as idiocy or imbecility, often followed by epilepsy, in early life; or insanity or epilepsy may occur at adolescence. In the natural course of events the stock will thus die out, or its worst members will be eliminated, and the healthy members, by breeding with sound stock, may in several generations get rid of the taint.

With regard to the *apparent increase of insanity*, we have the oft-repeated facts that the more humane treatment of the insane now adopted lengthens their lives. In many instances these patients have periodic intervals of sanity, during which they have children who inherit the weakness, and in their turn have to be cared for. Again, new tainted stocks may develop from the effects of environment. According to Dejerine, neurasthenia, the outcome of our present-day civilization, the pace at which many live, and the increasingly high standard of qualifications necessary in the struggle for a livelihood, may be the starting-point of all affections of the nervous system.

Marriage.—Savage[3] states his opinion that "certain persons who have suffered from a degree of mental disorder which may be classed as insanity, may yet recover and marry with no real increase of risk to their partner or to their children." In support of this opinion he mentions some adolescent cases with melancholic symptoms, and some with hypochondriacal ideas, who had recovered and afterwards married without having had any return of the malady; also some adolescent cases attended with maniacal excitement. He had met with a few women who had attacks of insanity before the menopause, and had married after that had taken place and had remained well; and a few cases of acute delusional insanity where marriage had followed recovery without untoward result. In such cases he thinks that the question of neurotic inheritance should be carefully considered before marriage is allowed. He thinks that marriage should be *prevented* in cases where there is a history of periodic recurrences, and especially if periods of depression and buoyancy have occurred at puberty and adolescence. Marriage should not be allowed where fully organized delusions and hallucinations exist, or where there has been epilepsy accompanied by any mental symptoms, or in cases of moral perversion. Marriage is risky in anyone suffering from constitutional nerve trouble depending on syphilis; and it should never be recommended as a means of cure for mental disease.

The Value of Physical Examination in Mental Diseases.—Lewis Bruce[1] considers it important to have the *blood* and *serum* examined in every case of insanity of whatever variety. If a hyperleucocytosis is found to exist, a searching examination of all the bodily organs and functions should be made, including a bacteriological examination of the fæces. He finds that hyperleucocytosis persists after an attack of confusional mania, and in a case of recurrent confusional insanity he based his diagnosis upon this point in order to differentiate it from one of manic-depressive insanity. He believes the leucocytes to be in some way actively associated in the production or efficiency of antibodies in excess of the toxins which cause the disease, and regards the hyperleucocytosis as an indication of the resistive power of the patient. This may further explain those cases of mental disease in which most trivial causes precipitate a relapse, the balance between the toxin and antitoxin being so delicately adjusted.

Apart from the mental disturbances occurring in myxœdema and exophthalmic goitre, he considers that derangement of the function of the *thyroid gland* has much to do with the production of mental disease. Lugaro, in "Modern Problems in Psychiatry," refers to the importance of the function both of the thyroid gland and of the parathyroids. A trophic function is attributed to the thyroid, and an antitoxic power to the parathyroids. Lewis Bruce refers to a case of stupor lasting six months, in which the onset was as sudden as occurs in petit mal. During the stupor the thyroid gland was hardly palpable. On recovery from the attack the patient remained well for six weeks, during which time the thyroid gland increased in size and could be felt. A second attack of stupor occurred, during which the thyroid gland diminished in size. The patient was treated with **Thyroid Extract** and recovered in six days. The thyroid treatment was continued for three months in small daily doses, and since then there had been no return of the malady.

Davidenkof[5] reports a case of dementia præcox. It was of the katatonic variety, and exhibited symptoms of Basedowism later on. A partial strumectomy was performed and improvement followed. Davidenkof thinks that although the rôle which the thyroid gland plays in Basedowism is well known, it is a mere hypothetical one in the case of dementia præcox.

In dementia præcox, the condition, he thinks, is probably a pluriglandular affair, the thyroid representing only one ring in a chain of glands. He believes that, by operating on the thyroid gland, the other glands of this chain were stimulated by aid of a "co-ordination chimique," and that their functions were modified in this way, resulting in an improvement in the patient's condition.

Rémond and Voivenel[6] refer to the increased activity of the suprarenal glands at the involutive period of life. This increased activity is believed to be the cause of the conditions which prevail so frequently at the time (hypertension, vertigo, buzzing in the head, and frequent headache), and may also be connected with the insanity which sometimes occurs at the climacteric.

Recoveries from Insanity.—Savage[2] says that about 30 per cent of the acute cases sent to asylums recover. This proportion seems to be rather low even for asylum cases only, and it takes no account of those relatively hopeful cases who, being in a position to afford treatment in private, are never sent to asylums.

In most instances recovery is slow and gradual, and is accompanied by a return to the normal of the various bodily functions, and perhaps also by the return of some chronic bodily ailment such as asthma or gout. When the patient resumes his normal habit of *sleep* it is a hopeful sign, in spite of the fact that in some cases of acute mania a good night's sleep is followed the next day by a considerable amount of violence. He regards *dreams* as an approach to recovery sometimes, although he has met with cases where a special dream heralded a return of the mental disorder.

In *puerperal* cases the improvement of the bodily and mental condition takes place simultaneously, and in such cases where some toxic cause exists he finds that recovery once begun progresses steadily. When the cause has been *alcohol* the chances of recovery are modified if the patient has a neurotic inheritance, also by the duration of the drinking habit, and the frequency with which marked mental disorder following upon alcoholic excess has recurred. In cases of *inherited* insanity characterized by the development of organized delusions, the prognosis is unfavourable; but with the same inheritance, if the case is one of recurring insanity, the prospect of recovery is much brighter.

In young patients the progress towards recovery is intermittent, but may end satisfactorily all the same. As Savage very aptly expresses it, youth is not on the side of the mental sufferer, although the prognosis is more favourable where there is excitement without mental weakness. Complete and permanent recovery may be looked for when there has been some definite cause to account for it, such as a toxin, if not of too long duration or too frequent occurrence. Complete recovery rarely takes place in chronic alcoholism. One may regard the fact that the patient realizes that he has been ill as a sign of complete recovery. Imperfect recoveries may leave intellectual or moral weakness.

For notes on **Adalin** as a sedative in states of excitement, *see page* 2.

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INSOMNIA.

Adalin in the acute infections and in cases due to slight pain (*page* 2); **Ocean Sanatoria** (*page* 27).

(*Vol.* 1909, *pp.* 14, 15)—Among the hosts of new hypnotics two drugs may be particularly recollected as of use in neurotic cases: **Bornyval** and **Bromural.**

INTERMENSTRUAL PAIN.

(*Vol.* 1910, *p.* 275)—Purefoy recommends a pill containing **Quinine** with **Cannabis Indica.** Help may be derived from **Arsenic** and **Aspirin.**

INTESTINAL SURGERY. *John B. Deaver, M.D., I.L.D.* / *D. B. Pfeiffer, A.B., M.D.* } *Philadelphia.*

Chronic Intestinal Stasis.—An important new field of abdominal surgery has been opened up by the work of Lane[1] in calling attention to the kinks which develop in the course of the alimentary canal, their influence in the production of chronic intestinal stasis, and the possibility of giving relief to this class of sufferers by correcting or obviating the faulty mechanics by surgical means. As shown by Lane, there are certain points of predilection where angulations of the intestinal tube are prone to occur. These are due in a degree at least to the upright posture of man, which favours a downward dragging of the intestines and a resultant crystallization of the lines of strain in supporting ligamentary bands which induce kinking or torsion at the points of attachment to the bowel. The first point at which this

is likely to occur is at the pylorus, due to the upward pull of the ligament between the pylorus and the under surface of the liver in front of the transverse fissure extending along the cystic duct and gall-bladder. The fuller the stomach and the lower it is dragged by its own weight and that of the transverse colon suspended below it by the gastrocolic omentum, the more marked are the kink and the consequent obstruction. This form has been frequently recognized heretofore, and attempts have been made to remedy it by means of such operations as gastropexy, plication of the gastrohepatic ligament, gastroplication, gastroenterostomy, etc.; operations which did not always have in view the underlying cause, and hence met with varying success in proportion as they met the indications. The second point is at the junction of the duodenum with the jejunum. Here the terminal portion of duodenum is fixed by ligamentary attachments, while the adjacent jejunum hangs free by a mesentery which will permit sharp angulation downward, forming a kink much like what would occur if the intestines were draped over a clothes line. The next weak spot is at the end of the small intestines. The cæcum, which may be capacious and heavy when filled with the food residue, tends by the force of gravity to migrate into the pelvis. This tendency is resisted by the crystallization of new lines of strain in bands which hook up the cæcum externally, and the appendix as well, causing defective drainage of that organ and increased liability to disease. As the ileum is pulled upon, it is caught upwards by the under leaflet of its mesentery, and kinking and torsion are produced in this situation. It is noteworthy that the appendix, which is often blamed for the disturbance due to this type of abnormality, is not the primary cause of the disturbance, but is itself involved in the process along with the cæcum and the ileum. Operative measures directed only at the appendix, therefore, are likely to fail in complete relief of symptoms. The same mechanical conditions are likely to arise at the hepatic and splenic flexures of the colon, and under special conditions at other situations. The various modifications of the sigmoid are also a frequent hindrance to the free onward passage of the bowel contents In this situation the difficulties are due not only to kinks and embarrassing bands, but to redundancy of the bowel. Lane is impressed with the frequency with which faulty sigmoidal drainage is connected with tuberculosis, and has not hesitated to operate upon tuberculous subjects for the purpose of correcting the anomaly in hopes of raising the patient's general resistance, and as he states, "with the greatest advantage to the patient, whose local and general conditions have improved in a marvellous manner." It is of course conceivable that the correction of such a condition would act favourably upon tuberculous as upon non-tuberculous subjects, but the supposition of a special connection between this condition and tuberculosis as yet lacks foundation, and it is to be hoped that the possibilities for good in the operation will not be diminished by over-enthusiasm.

Symptoms — These are well summarized by Chapple[2] in a study of 50 cases. The major symptom is not constipation, though that is always present, but pain which is variable in character, location, and severity, and frequently sufficient to constitute chronic invalidism. The remaining symptoms are those which are commonly grouped under the title of autointoxication. They are: headache, attacks of nausea often followed by retching or vomiting, loss of appetite, loss of weight, markedly cold hands and feet, mental apathy, constipation, a constantly foul taste in the mouth, attacks of abdominal distention, and general muscular pain. The *physical examination* shows skin-staining and involution changes in the breasts similar to chronic mastitis. The abdomen may present tenderness over the affected areas of bowel, which may at times be palpated. *Radiographic examination* after a bismuth meal may reveal the abnormality itself. Several such instances are pictured by Jordan[3] (*see Plate XX*).

To the uninitiated it would seem that the interpretation of radiograms of this sort would be subject to more than the ordinary difficulties and fallacies of *x*-ray examinations. These diagnoses, however, are reported as confirmed by operation. Jordan's studies lead him to the conclusion already held by clinicians, that abnormalities of this sort in one part of the bowel are as a rule associated with similar abnormalities elsewhere along its course, though the symptoms may be due chiefly to the accentuation of the condition at one point (*see also page* 66). Chapple in his article abstracts 50 cases of Mr. Arbuthnot Lane, and highly praises the results of operation. The constipation is cured and the patients gain in weight and general well-being. There has been a persistence of pain in some cases, which is variously attributed to (1) Occasional attacks of flatulent distention; (2) Dilatation of the blind end of the lateral anastomosis; and (3) Newly formed adhesions of the small bowel. There were two failures due to persistent general adhesions. The operation performed is an ileocolostomy, preferably by the end-in-side method, supplemented by colectomy if pain has been a prominent feature. The early mortality is not stated, but in the year June, 1909 to June, 1910, there were 16 cases with one death, which was due to the bursting of an abscess of the abdominal wall into the peritoneum. Shock is said to be conspicuously absent.

Chapple[4] has also written a paper in which are given the conception of Mr. Lane regarding the rôle played by chronic intestinal stasis in predisposing to *tuberculosis* and favouring its ravages, and the protocols of eight cases in which ileo-colostomy was performed. The best that can at the present time be said of the proposal is the Scottish verdict, "not proven."

Rockey,[5] following up Lane's work, proposes to do away with the necessity for primary or secondary resection of the colon in any case, by making at the time of the ileo-colostomy an appendicostomy. His ingenious method of doing this (*Fig.* 88) is thus described:—

PLATE XX.

SKIAGRAMS BY DR. A. C. JORDAN ILLUSTRATING LANE'S ILEAL KINK

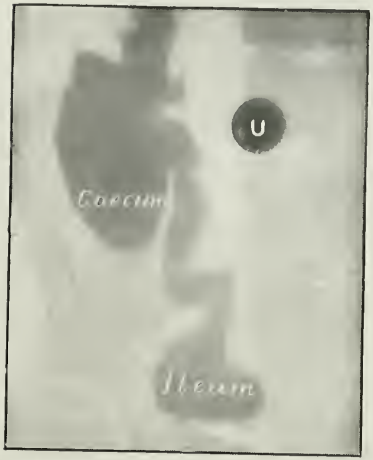


Fig. A.—Taken 10½ hours after a bismuth meal, showing the long terminal coil of the ileum rising out of the pelvis. Fixed by adhesions at the point X. (Confirmed by operation.) U, Umbilicus.

Fig. B.—A sharp kink, causing obstruction at a point 4 inches from the ileo-cæcal valve. The ileum was firmly fixed to the iliac fossa at this point. Above and below it was freely movable. (Confirmed by operation.) U, Umbilicus.

Prepare for making the appendicostomy incision by grasping the right side of the abdominal wall in the hand, placing the thumb and index finger directly opposite each other at the outside of the rectus, thus bringing the thinner aponeurotic portion of the abdominal wall firmly in grasp at a place usually an inch or so below McBurney's point. Pass a narrow-bladed scalpel through the abdominal wall alongside of the finger from within outward. Fasten a long rather soft artery forceps to the scalpel blade on the outside, and draw the knife into the abdomen, pushing the forceps in with it. This manœuvre prevents the slipping of any of the tissue planes, and brings the forceps within the abdomen with the smallest possible incision. Grasp the tip of the loosened appendix and the ends of the catgut ligature on the mesentery with the forceps and draw out through the abdominal wall. Prepare a small roll of gauze about the size of the little finger and about three inches long, and fasten the tip of the appendix to the middle of the gauze with a stitch, and roll it round the gauze until the caput of the cæcum is drawn up against the abdominal wall. Tie the catgut from the mesentery across the roll alongside of the appendical curb, thus supporting the cæcum in position without tension on the appendix. The gauze is now bent in a horseshoe shape, and secured with a safety pin.

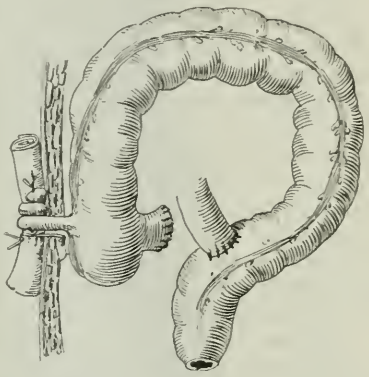


Fig. 88.—Rockey's method of Appendicostomy.

Intussusception.—The literature on this important subject has received several additions of interest during this past year. Adams[6] analyses 100 cases treated at St. Thomas's Hospital during the last eight years. Seventy cases occurred in children. The varieties, using the most simple and preferable classification, were: (*a*) entero-colic 73, (*b*) colic 16, (*c*) enteric 10.

Symptoms.—Of the three leading symptoms, abdominal pain, vomiting, and the passing of blood per anum, pain was absent in only one case, vomiting was absent in six, and blood was observed in the stool in all but 15 cases. The older the patient the less likely was blood to be passed per rectum. The essential sign of intussusception is considered to be the presence of an abdominal tumour, "and in any doubtful case with a history of abdominal pain, vomiting, and the passage of blood per anum, it is the duty of the medical attendant to administer an anæsthetic if ordinary palpation is not satisfactory." The value of this procedure is shown in that "of these 100 cases, 68 possessed a tumour which could be easily felt, 19 required the

relaxation of an anæsthetic to reveal the tumour; in 12 no tumour could be felt, but 11 of these had no anæsthetic, most of them being too ill for any interference."

Rectal examination is scarcely less valuable. The apex of the intussusception was felt in 27 cases. In five a tumour could be found by bimanual palpation. Rectal examination was negative in 58 cases. Of 91 cases which were operated upon, 59 recovered and 32 died. The mortality mounts directly as the duration of the disease before operation increases.

Watts[7] reports two cases of *intussusception in the adult*, one due to multiple adenomata of the intestine, the other to a sarcoma of the cæcum. The first case was most interesting, and necessitated several operations before final recovery. The appearance of the tumours, of which eleven were removed by resection and enterostomy, can be seen in the accompanying illustration (*Plate XXI*). Pathologically the growths were benign glandular polyps.

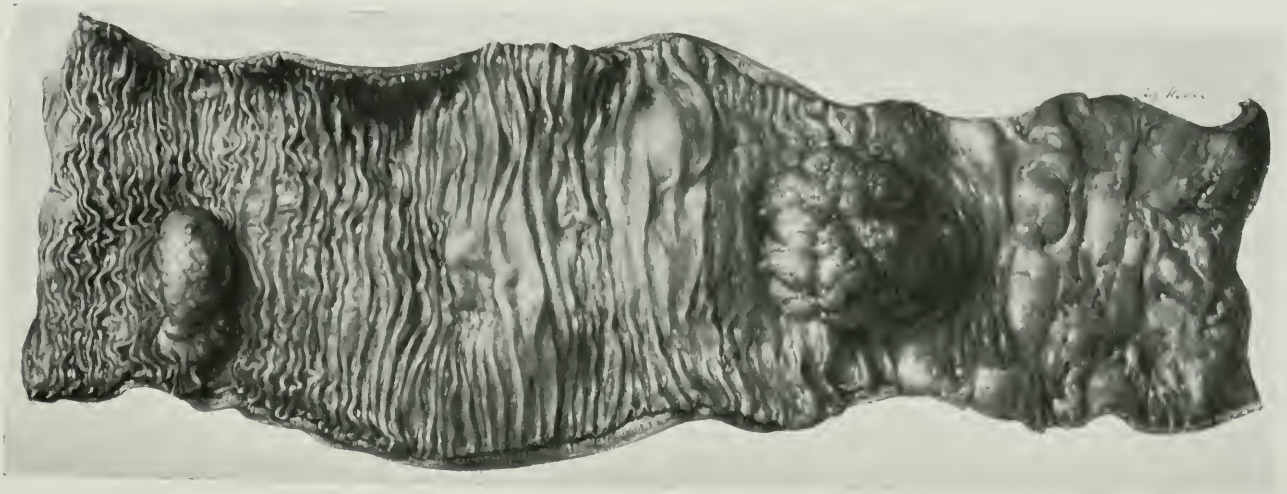
An extensive treatise on the subject of intussusception in adults is given out by Eliot and Corscaden,[8] who have succeeded in collecting 300 cases, and have tabulated them in accordance with the exciting cause so far as could be determined. Forty-three cases of spontaneous passage of necrotic intussusception per rectum are abstracted, and the fact is pointed out that even in such an exceptionally fortunate termination of non-operative treatment, death often occurred a few months later from obstruction due to stricture at the point of sloughing.

Diseases of the Large Intestine and Rectum in Children.—Experience in the treatment of colonic and ano-rectal affections has convinced Gant[9] that the discomfort and pain from which infants and children suffer are to be found in these localities much more frequently than is suspected.

Colostomy.—The vexed question of a colostomy satisfactory as to function and free from the almost prohibitive misery entailed by inability to control the discharge of gas and fæces, has received three contributions towards solution during the year. Bond's[10] method, which is adapted to both ureteral and bowel fistulæ, consists in surrounding the emerging bowel or ureter with a flap of skin by means of a simple plastic operation, in such a way that a large papilla or teat is formed, carrying the opening at the summit. This markedly facilitates the fitting of a proper vessel for the reception of the discharges. Lilienthal[11] contrives to secure control of the bowel by introducing a twist in the intestine as it passes through the abdominal wall. The principle is readily grasped from the accompanying illustrations (*Figs.* 89, 90, 91, 92.) He has tested the operation many times during the past eight years, and claims that it obviates nearly all the discomforts and filthiness of colostomy. "The patients have absolute control of the bowels, and can even hold a considerable amount of fluid injected into the colon. The bowels move once or twice a day, the patient knows when the movements are about to occur, and he is not annoyed by the necessity of wearing an appliance." Marro's[12] method consists

PLATE XXI.

WATTS'S CASE OF INTUSSUSCEPTION DUE TO MULTIPLE ADENOMATA OF THE INTESTINE



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fundamentally in causing the proximal end of the divided intestine, after mobilization, to pass through a subcutaneous tunnel which is

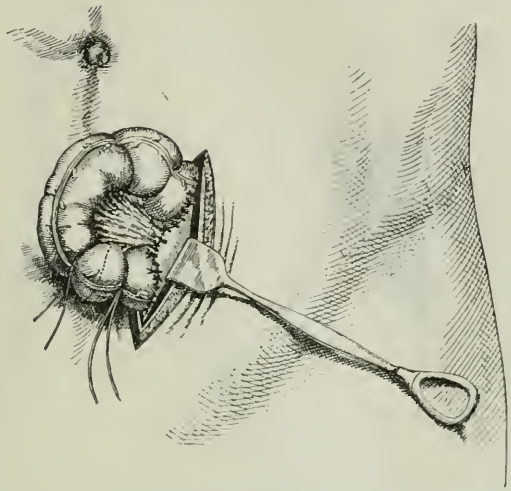


Fig. 89.—Colostomy: Lilienthal's operation. The dotted line shows line of section. The blunt retractor holds outer third of rectus muscle together with skin and aponeurosis.

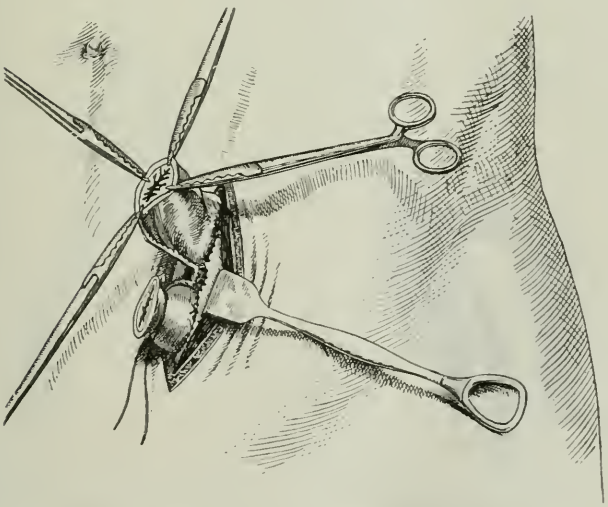


Fig. 90.—Redundant bowel and mesocolon cut away. Twisting of the intestine begun.

parallel to the external border of the rectus muscle, in such a way that a simple belt (that of the drawers for instance) should play the part

of an effectual and comfortable band of compression on the intestinal segment running between skin and anastomosis. He has been able to

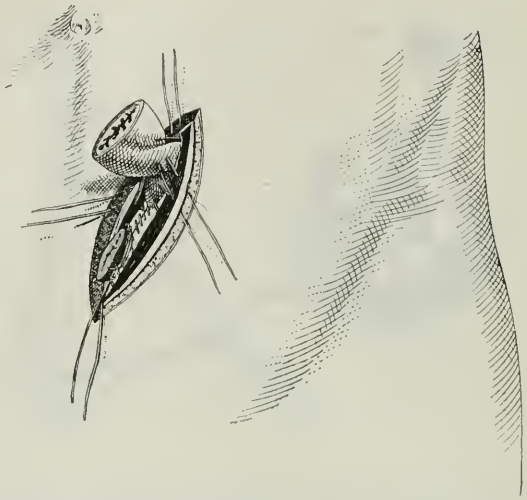


Fig. 91.—Twist complete and maintained in position by anchor sutures holding sigmoid to aponeurosis.

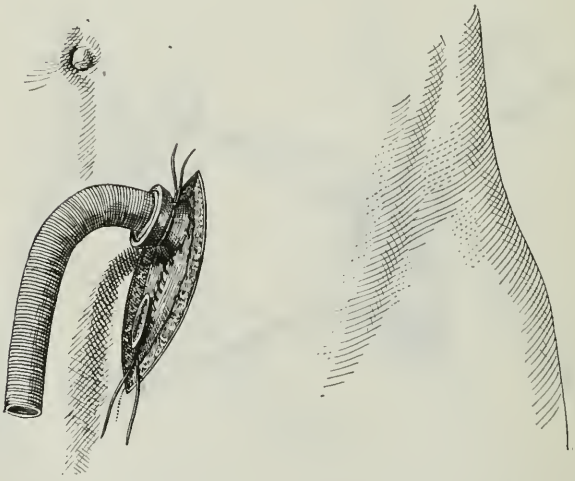


Fig. 92.—Operation complete. Aponeurosis further stitched to intestine and wound closed with the exception of the skin.

show the feasibility of the operation in three cases, though prolonged observation of the result has been impossible owing to the early death

of the patients from the inoperable growths which necessitated the intervention. Marro protects against the danger of infection arising from drawing the divided intestine through the tunnel, by careful and prolonged sterilization of the gut by the actual cautery. It seems probable that the successful accomplishment of this method would permit control superior to any other method in use, and should practice justify its performance, it may be a valuable aid in those conditions which, though curable, necessitate the establishment of an artificial anus.

Diverticulitis.—The rapidity with which this affection has taken on a definite clinical entity has but few parallels in medical literature. Described occasionally as a curious post-mortem finding, as late as 1904 in *Nothnagel's Encyclopædia* it is stated that "as these lesions (acquired diverticula) are chiefly of anatomic interest and have very little clinical significance, only a few general remarks will be made on this question" (Graves[13]). In 1906 Sampson & Gogornier published a case of obstruction due to diverticulitis of the small intestine, and in 1907 W. J. Mayo recorded five cases of diverticulitis of the sigmoid, and was able to collect only 18 other cases from the literature. Since then others have been reported with such frequency as to demonstrate that while not a common condition it is yet one to be reckoned with as a cause of both acute and chronic abdominal disease. These diverticula have not so far been observed as a congenital condition, the youngest individual so far as is known being 22 years of age. If there be any congenital defect at the bottom of their development, they at least require the internal pressure incident to the function of the bowel to cause their formation. They may be considered as herniæ of the innermost portions of the intestine, and develop, as do herniæ of other varieties, at the point of least resistance, namely, between the folds of the mesentery where the vessels penetrate the bowel, and into the appendices epiploicæ, where the fat of those structures is continuous with the subserous fat, as Bland-Sutton has pointed out. They may occur practically anywhere along the course of the bowel, but their site of predilection is the large intestine, and especially the sigmoid. They affect individuals well on in years and are almost always multiple. Their form invites the stagnation of fæcal material within their lumen and the starting of inflammation, much as in a strictured appendix. Hartwell and Cecil[14] compare the pathology of diverticulitis with that of appendicitis. Thus there "may be (1) Acute inflammation without perforation, but with peritonitis by extension; (2) Acute inflammation with perforation, which may result in localized abscess, general peritonitis, or abnormal communications with a neighbouring organ, such as the bladder; (3) Chronic inflammation without marked lesions with temporary exacerbations; (4) Chronic inflammation with considerable thickening of the walls; (5) Possible development of cancer. The differences are that gangrene of the appendix is common, whilst that of a diverticulum has perhaps never been heard of; inflammation of the appendix affects the mucosa, whilst the mucosa of a diverticulum remains normal until perforation is imminent."

Symptoms.—These also resemble very closely those due to analogous processes in the appendix, varying of course with location. The typical syndrome of diverticulitis consists in pain, rigidity, and tenderness in the left lower quadrant of the abdomen. In the absence of other demonstrable cause, diverticulitis should be suspected, but it will scarcely be possible as yet to diagnose the majority of these cases before opening the abdomen. The indications for surgical treatment will more often be plain.

During the past year Bruce[15] has reported a case of acute diverticulitis of the sigmoid. There was a perforation, and the patient exhibited the symptoms of left-sided appendicitis. Numerous diverticula existed in the bowel. Graves[13] reports ten cases variously situated, and Giffin[16] two instances in the rectum. We append an illustration of an interesting case of rectal diverticula from the Bristol General Hospital. *Plate XXII* shows the site of a fatal perforation.

Graves reports his interesting cases in detail. The cases of Giffin emanating from the Mayo clinic are rare, and probably the first examples of operative extirpation of rectal diverticula. In one case carcinomatous changes were present. Giffin was able to find only nine instances recorded of rectal diverticula, seven of which were post-mortem findings, while two had necessitated an enterostomy for obstructive symptoms. He points out that diverticula are probably more common in the rectum than the figures would indicate, since this is usually the least thoroughly examined part of the bowel at necropsy.

Wilson[17] suggests that diverticula of the lower bowel may have an important bearing upon the development of carcinoma, since four of the fifteen cases now observed in the Mayo clinic showed carcinoma superimposed.

References.—[1]*Brit. Med. Jour.* 1911, i. 913; [2]*Ibid.* 1911, i. 915; [3]*Pract.* 1911, 567; [4]*Lancet* 1911, i. 1130; [5]*Ann. Surg.* 1910, May; [6]*Pract.* 1910, 679; [7]*Ann. Surg.* 1911, 408; [8]*Ibid.* 1911, 169; [9]*Jour. Amer. Med. Assoc.* 1910, Oct. 15; [10]*Brit. Med. Jour.* 1910, ii. 1357; [11]*Ann. Surg.* 1910, 384; [12]*Ibid.* 1911, 252; [13]*Bost. Med. & Surg. Jour.* 1911, i. 372; [14]*Amer. Jour. Med. Sci.* 1910, Aug; [15]*Ann. Surg.* 1911, 684; [16]*Ibid.* 1911, 533; [17]*Ibid.* 1911, 223.

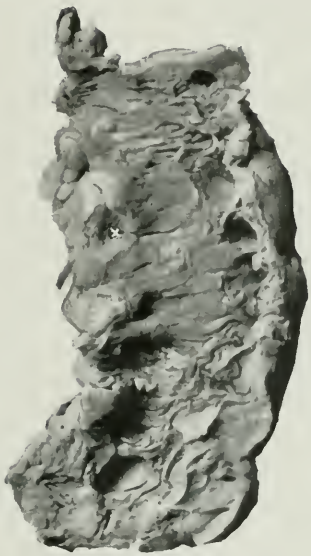
JAUNDICE, EPIDEMIC. *E. W. Goodall, M.D,*

A small outbreak in Winslow is reported by Vaisey.[1] There were, from November to April, some 30 cases. The ages of the patients ranged from two to sixty years. The symptoms were jaundice, clay-coloured stools, constipation, vomiting, general malaise, inability to take food, particularly fatty substances, pyrexia, constant pain over the liver, headache, loss of flesh and muscular strength. When one member of a family became affected, almost invariably the other children in the house contracted the disease in a week. A smaller but similar outbreak in Crossdoney, Ireland, is reported by Collis Hallowes.[2] Miles,[3] in describing an outbreak at Stantonbury, Bucks, suggests that the disease may be due to the pneumococcus.

References.—[1]*Brit Med. Jour.*, 1911, i, 935; [2]*Ibid.* 1911, i, 1464; [3]*Ibid.* 1911, ii, 379.

PLATE XXII.

RECTAL DIVERTICULA



X marks site of fatal perforation

Bristol General Hospital Museum, No. 93·1

(Photograph kindly lent by Dr. G. Scott Williamson Pathologist to the Hospital)

JAUNDICE, FAMILIAL. *Robert Hutchison, M.D., F.R.C.P.*

A short account of this interesting condition was given in the *Annual* for 1910. Since that time many more cases have been published—amongst others by Mackintosh and Falconer,[1] Tileston and Griffin,[2] Poynton,[3] and Aschenheim.[4] From a consideration of the literature it is evident that the disease may appear in various types. Of these, the most striking is that in which it appears as a hereditary and familial affection occurring in several generations (e.g., three or four) and in several members of each generation. When occurring as a hereditary affection, the disease affects males and females equally, and may be transmitted both by males and females. In some of the recorded families males only are affected, in others females only. So far no case has been recorded in which an unaffected member has transmitted the disease. In a second type the disease appears as a familial affection, but no history can be obtained of its previous occurrence in the family. In a third class are isolated cases first appearing at birth or in early childhood, and there is a fourth type in which the disease first appears in early adolescence or adult life. This last type differs from the others only in the fact that the cases, as a rule, present much more severe symptoms than the hereditary or congenital cases.

Diagnosis.—Tileston and Griffin point out that chronic family jaundice has to be distinguished from the following conditions which more or less resemble it:—

1. *Congenital Obliteration of the Bile-ducts.*—This process, due either to congenital malformation or to inflammatory changes, leads to intense obstructive jaundice, visible at birth. It is incompatible with the long continuance of life. In some cases, however, there is only stenosis of the common duct, and the patient may live many years, with jaundice and partial decolorization of the stools; the gall-bladder is greatly dilated, from which fact and the time of appearance of the icterus the diagnosis can be made.

2. *Fatal Icterus Neonatorum without Obstruction of the Bile-ducts.*—Very rarely families are met with in which almost all the children—and they are many—become deeply jaundiced a few days after birth, and usually die within a period of days or weeks, often with convulsions. Bile is found in the urine, but the stools are well coloured. Those infants which do not die early, recover from the jaundice completely, but are very anæmic for a while. At autopsy nothing has been found to account for the jaundice; in particular there has been no obstruction of the bile-passages, and no evidence of septic processes or syphilis. A curious feature is the "kernicterus" of Schmorl; the ganglia at the base of the brain are an intense yellow, while the rest of the brain is only slightly icteric; the yellow areas show necrosis of the nerve cells. This type of icterus is peculiar to jaundice of the newborn, and has been reported chiefly in connection with the family type.

3. *Juvenile Family Cirrhosis.*—Cirrhosis occurring in two or more children of a family has been described by a number of writers. A few

of these cases may be attributed to hereditary syphilis, some others to the use of alcohol or other irritating substances ; thus, the two children reported by Jollye[5] both drank vinegar in large quantities. For the majority, no cause could be made out. The course resembles that of Hanot's cirrhosis, ending fatally before the twentieth year. The growth is usually stunted.

4. *Familial Splenomegaly of the Gaucher Type.*—This truly remarkable disease, first described by Gaucher in 1882, is characterized by enormous enlargement of the spleen (up to 7000 grams) lasting over many years, usually occurring in several members of a family, and affecting females almost exclusively. The liver is always considerably enlarged. Anæmia is seen, and brown pigmentation of the skin, but jaundice is seldom, and ascites never, present. The histological appearances are pathognomonic. The spleen, bone-marrow, lymph nodes, and in the liver the ramifications of Glisson's capsule, show large numbers of peculiar cells, with small nuclei and much protoplasm. Marchand has recently shown that the large size of the cells is due to a deposit of a homogeneous material like hyaline, the nature of which could not be determined.

Chronic family jaundice is easily recognized if it be only borne in mind : The occurrence of jaundice in other members of the family, the chronicity, the early onset, the presence of bile in the fæces and its absence from the urine, the changes in the blood, and the enlargement of the spleen without enlargement of the liver or indications of cirrhosis, are the important diagnostic points. From juvenile cirrhosis it is distinguished by the absence of marked enlargement of the liver, the absence of stunting of the growth, the absence of bile in the urine, and the course of the disease. Splenomegaly of the Gaucher type may be excluded by the presence of jaundice, the absence of marked enlargement of the liver, and by the fact that Gaucher's disease is familial but not hereditary. The acquired form of chronic family jaundice is distinguished from pernicious anæmia by the increased fragility of the red cells in the former, and by the morphology of the blood. The frequent complication with gall-stones has led to the diagnosis of jaundice due to obstruction of the common duct by calculi. This error can be avoided by attention to the above-mentioned points.

Pathogenesis.—This is still involved in obscurity. It is generally believed, as stated in 1910, that there exists in these cases an inborn fragility of the red cells which causes them to break down with abnormal ease, but it has recently been suggested that the real cause of the affection is some error of metabolism, which leads to the production of autogenic hæmolytic toxins. The mode of production of the jaundice is also disputed. The most widely accepted view is that it results from inspissation of bile in the liver, but Widal and his pupils have called attention to the lack of any evidence for this, and suggest that the jaundice is due to a purely pigmentary cholæmia, possibly arising in the blood itself, just as bilirubin is produced at the seat of old hæmorrhagic foci.

These recondite questions are fully discussed in an elaborate article by Thayer and Morris,[6] in which the whole literature of the disease is also reviewed.

REFERENCES.—[1]*Edin. Med. Jour.* 1911, Feb.; [2]*Amer. Jour. Med. Sci.* 1910, June; [3]*Lancet*, 1910, Jan. 15; [4]*Münch. med. Woch.* 1910, 24; [5]*Brit. Med. Jour.* 1892, i, 858; [6]*Johns Hop. Hosp. Bull.* 1911, Mar.

JOINT INJURIES: MANIPULATION IN TREATMENT.

A. H. Tubby, M.S., F.R.C.S.
Robert Jones, Ch.M., F.R.C.S.E.

Every sound method of treatment must be firmly based on a due appreciation of the physiological and pathological state of the affected tissues and of all the conditions which influence their function and well-being. Purely mechanical considerations of stress and strain can never be neglected with impunity when we are dealing with injuries and diseases of bones and joints, whose chief function is mechanical.

The disabilities which commonly follow injuries about joints are continued pain and stiffness. The dread of a stiff joint being the result of an injury has led to the general use of **Massage** and of **Passive Movement.** We purpose here to indicate conditions under which passive movement ought to be employed; and others in which we regard its use as absolutely prejudicial. First, we must premise that massage and passive movement are two absolutely distinct methods of treatment; unfortunately, many exponents of massage habitually make movement part of the routine of treatment by massage. This point will be elucidated in due course.

In dealing with any injury, the fundamental facts of the processes of inflammation and repair must be kept constantly in mind. Every tissue which has received an injury, whether mechanical or infective, becomes the seat of a reaction involving exudation, increased vascularity, the removal of débris and of blood-clot, the repair of damaged tissues, and ends in the formation of new blood-vessels and new connective tissue, which may be fibrous tissue or, as in bone, callus. If recovery is to take place, this process of "inflammation," leading to repair, must occur. Our duty is to aid the process and hasten the restoration of the function of the part.

Massage, especially in its gentle forms, promotes the absorption of exudation and blood-clot, clears the venous channels, helps the free circulation of blood, and improves the nutrition of tissue. We have therefore nothing to say against the use of massage in any stage of the treatment unless it involves injudicious movement.

Nature rebels against active movement of any part in which there is acute inflammation. The patient experiences pain if any movement is attempted, and the muscles remain on guard to prevent any disturbance of the part. From these facts we learn an important lesson as to when we ought not to employ passive movement.

The different types of case may be illustrated by two common conditions of the *shoulder*. The first is that form of subacute arthritis of the

shoulder, often not accurately diagnosed, and mistakenly regarded as a rheumatic manifestation, which is due to indirect injury or concussion of the joint, such as a fall on the hand or elbow, and is frequently a sequel of Colles' fracture of the radius. The characteristic feature of this condition is that no symptoms are referred to the shoulder joint for three weeks after the injury. The patient then complains of pain and increasing difficulty in moving the shoulder. On examination, movement of the shoulder is limited in every direction, including rotation, owing to pain, and muscular resistance guarding the inflamed joint. Tenderness on pressure below and to the outer side of the coracoid process is practically pathognomonic of arthritis of the shoulder. Any attempt to restore mobility in such a case by passive movements is disastrous, for it further irritates inflamed tissues, and causes erosion of the cartilage, when it is softened and vascularized by the subacute inflammation, thus promoting the formation of adhesions and an intractable ankylosis.

The *treatment* called for is absolute quiescence of the joint for three months, with the arm kept to the side. This allows the reaction in the joint to quiet down, and repair takes place undisturbed. The signs of recovery are absence of pain on pressure under the coracoid, and the appearance of tenderness on pressure over the insertion of the deltoid. This latter symptom only appears in the later weeks of recovery, and is sometimes diagnosed as a subdeltoid bursitis. Movements of the shoulder after such a period of rest are found to be free from pain, and the patient, when he is allowed to try, should find a daily increase in the range of voluntary movement. Any reappearance of pain may mean a recrudescence of the arthritis, indicating that movement has been resumed too soon. If, however, the pain is only experienced on movement in one direction, it may be due to some slight adhesion, and disappears after this is broken down.

In contrast to the above, let us consider the case of a stiff shoulder, the result of adhesions after some wrench, twist, or direct injury about the shoulder-joint, not necessarily amounting to an actual dislocation or fracture of the neck of the humerus, though the stiffness following the last condition is often a severe degree of this type.

The *diagnosis* is based on the following facts. First, there is a history that pain was felt in the shoulder immediately after the injury, and there is no question of there having been an acute condition of the joint in consequence. This has been followed by stiffness and pain. There is not the tenderness on pressure under the coracoid process which would indicate arthritis; only, some movements are limited in range, and pain is experienced on moving the limb in certain directions. All these indicate that the limitation of movement, and the pain are due to extra-articular adhesions, not to inflammation within the joint. The *treatment* is to break down the adhesions. We prefer, when possible, to do this without an anæsthetic, and then we adopt the following procedure. The patient is first asked to stretch his hand as far up a door-post as he can, and the point reached by his finger is marked. He then sits on a

chair, and, while an assistant fixes the shoulder-blade with his hands, the surgeon places one fist in the axilla to control the head of the humerus and prevent its displacement downward. The arm is then slowly but firmly moved once through each of its movements. The most important movements—because they are usually most impaired—are abduction and outward rotation. The surgeon therefore endeavours to bring the patient's hand to the back of his neck, with the arm abducted to a right angle. In doing this, the snapping of adhesions will be heard and felt.

The arm is then returned to the side, and immediately the muscles of the shoulder are vigorously rubbed and slapped until the skin flushes. This rough massage rapidly relieves the pain.

The patient is now asked to return to the door-post and to show that he can reach several inches past his former mark. This demonstrates to him that he can now really move the shoulder, if he tries. This has a valuable moral effect, and it is for this reason that we prefer to dispense with a general anæsthetic. He must now move the arm freely every three or four hours, and it is most important that he should practise regularly stretching up a door-post or wall, till he can bring his elbow and arm flat against the wall and drop his hand to the back of his head.

If the arm is fixed to the side after passive movement and breaking down of adhesions, it will get stiff again in twenty-four hours. Massage and repeated alternate bathing in hot and cold water, help greatly to restore mobility in such cases.

These two instances indicate that a joint which is the seat of an actual inflammatory process is only injured by movement; whilst movements both active and passive are necessary in a joint which is rendered stiff by adhesions; but this can only be done after active inflammation has ceased.

Elbow-joint.—We frequently see cases of *fracture about the condyles of the humerus* which have resulted in a stiff elbow in spite of early and persistent passive movement. Practitioners are often astonished when we express the opinion that the stiffness is due to the passive movement, and that, if the elbow be forced into full flexion and left in that position for three weeks, free movement will be recovered. In this case, early passive movement disturbs the young callus and other repair tissue about the joint, and causes a fresh exudation and reaction, the result of which must be an increase of the mass of repair tissue. Excessive callus in front of the condyles forms a serious mechanical impediment to flexion of the elbow. In all injuries about the elbow, except fracture of the olecranon, we recommend full flexion of the elbow with the forearm supinated. If this position is secured, no excessive callus can form in front of the elbow to block flexion. The tendon of the triceps forms an excellent splint at the back of the joint, and effectively prevents any great excess of callus in that region. Some broadening of the condyles often occurs, but this is no impediment to function. After the first forty-eight hours, the wrist may be slung up to the neck close under the chin. It is impossible to state in figures

the number of weeks the elbow is to be kept in this position ; but we have a reliable clinical test to tell us when the wrist may be lowered. This test was introduced by Owen Thomas to determine when a tuberculous elbow was "cured ;" and we have found it equally serviceable in all other conditions. It may be described as follows: "When all tenderness on pressure about the elbow has disappeared, and the surgeon is tempted to think that the inflammatory reaction has ceased, he lowers the wrist about three inches from its position close under the chin, and leaves it slung in that position. At the end of three days he sees whether the patient can move the elbow through the small range allowed by the lengthened sling. If this can be done, the sling may safely be still further lengthened." Thus, in ten days, under gravity alone, a full range of movement, from full flexion to within 10° of full extension, will nearly always be obtained. Passive stretching is often necessary to secure the last 10° of extension. If, on the other hand, the elbow has become stiff in the new position, and the patient cannot bring his wrist back to the neck, it is a sure sign that there is still an active process going on at the elbow-joint, and that a longer period of rest in full flexion is required. This is true whether the process be the reaction after an injury, an infective arthritis, or tuberculous disease.

Dislocations of the Elbow-joint are frequently followed by localized "myositis ossificans," or the formation of spicules of bone in the muscles, especially the biceps, brachialis anticus, and sometimes the triceps. This condition is very crippling (*Plate XXIII, Fig. A*). Some years ago one of us (R. J.) published a series of cases, and advised *operative removal* of the newly-formed bone. The subsequent history of these cases has proved that the condition recurs in spite of operation. We would now recommend treatment by rest in the flexed position (*Fig. D*), in the hope that the formation of new bone may thus be reduced to a minimum, for any movement of irritation of the part only excites the formation of more bone. If a stiff elbow is inevitable, it is best that it should be at an angle of about 45°, for then the patient can get his hand to the mouth and to the back of the neck. It is a great disability to a man if he cannot get the hand up to button his collar, and to a woman if she cannot do her hair.

Wrist.—At the wrist, stiffness may occur after such injuries as Colles' fracture, fracture of a carpal bone, a bad sprain, or such a condition as gonorrhœal arthritis. Here, again, two distinct types must be recognized ; namely, mechanical stiffness and inflammatory stiffness.

Mechanical stiffness may result from imperfect reduction of a fracture, from blocking of hyper-extension, or from fibrous adhesions. In such case, the cause should be removed, adhesions broken down, and movement practised, as in the case of adhesions of the shoulder. In the large majority of cases, however, the stiffness is due to a subacute inflammation, and is often kept up by injudicious passive movement.

We are often consulted about cases of *Colles' fracture*, in which the fracture has been well reduced and union has taken place in fairly good position. At the end of a week or ten days, sometimes earlier, passive

JOINT INJURIES: TO ILLUSTRATE MANIPULATION IN TREATMENT

Fig. A.—Myositis ossificans traumatica

Fig. B.—Schlatter's disease

Fig. C.—Injury at insertion of tendo Achillis in os calcis

Fig. D.—Dislocation of elbow joint: rest in the fixed position

Fig. E.—"Mallet finger" or "Dropped finger."

movements were begun, with the result that the wrist became more painful and stiffer than it was when this treatment was commenced. Massage alone would have been beneficial, but injudicious passive movement has stirred up the whole region into a state of subacute inflammation. The treatment advised is rest. The position of choice in all cases of stiff wrist is with the wrist dorsiflexed. If an ankylosed wrist is inevitable, it is in this position that the grasp of the fingers is most powerful. A second reason is, that it is in the dorsiflexed position that the most perfect control of the wrist-joint, and therefore the most perfect rest, can be secured.

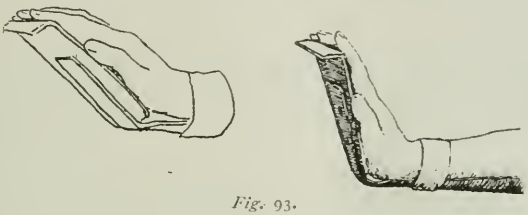


Fig. 93.

Knee-joint.—Difficulty is sometimes experienced in differentiating between various injuries about the knee-joint, which result in continued pain and stiffness. If the original injury was a sprain of the internal lateral ligament, with displacement of the internal semilunar cartilage, it will be found that there is definite tenderness on pressure over the attachment of the deeper fibres of the ligament to the upper part of the inner tuberosity of the tibia. There is often a little lateral movement in the knee, and abduction of the leg produces pain at the inner side of the knee by stretching the internal lateral ligament, and there is a history of recurring effusions after any slight strain. This is a subacute inflammatory condition, which demands rest in a position which keeps the internal lateral ligament relaxed. On the other hand, a stiff painful knee is often the result of some adhesions which have formed, fixing some part of the aponeurosis of the quadriceps to either side of the patella and its ligament. On examination, it will usually be found that only the movement of flexion produces pain, but passive extension is painless. The pain can generally be localized to some definite part of the aponeurosis in front of the knee, and there is no effusion. This is a mechanical, not an inflammatory, stiffness. The adhesions may safely be broken down and movements practised.

We have dealt, hitherto, chiefly with injuries in and about the structures which take part in the formation of joints, and have indicated that pain and stiffness, which are the results of subacute inflammatory processes, demand rest, not movement. Space will not allow us to extend this principle to the treatment of *rheumatoid and rheumatic arthritis*. We would only say that whatever the ultimate toxic or metabolic irregularities may be which produce these conditions in

joints, it ought to be remembered that the joints themselves are the seat of hyperæmia and the articular cartilages are often soft and easily injured. The ends of the bones are vascular, often tender, easily strained, and prone to the formation of osteophytes. Therefore, while the physician is treating the actual cause of the condition, he ought not to forget that the joints demand rest and protection from strain. If this treatment be followed, the ultimate deformities and disabilities can be greatly reduced, if not avoided altogether.

Injuries of the Insertions of Tendons.—It is not uncommon for the insertion of a tendon to be torn or partially separated from its attachment. If time is not allowed for it to unite firmly before allowing movements which put a strain on the tendon, one of two things will follow—either the new repair tissue will stretch, and the function of the muscles and tendon will be impaired; or, in addition to stretching, an inflammatory reaction will be set up, merely by the mechanical irritation.

A common example of this is to be found in injuries of the attachments of the extensor tendon of the fingers to the base of the terminal phalanx, or sometimes of the attachment to the base of the second phalanx. The injury is produced by a blow or fall on the end of the finger, with sudden flexion which tears or separates the attachment. A few days' rest on a straight splint is generally sufficient to allow all immediate pain to subside and to let the tendon reunite. If the patient is now permitted to use the finger, he can at first extend it fully, but in a few days he cannot do so. This is due to stretching of the young repair tissue. If this is associated with an active reaction, the joint becomes swollen and tender; and it may so remain and is slightly flexed and stiff for weeks. Passive movement in order to get rid of the stiffness only makes the condition worse, and we have known of a case in which tuberculous disease, lighted up by the injury, was suspected. The diagnosis should not be difficult. There is the history of injury, passive extension causes little or no pain, passive flexion is acutely painful, pain and tenderness are most acute just over the insertion of the tendon into the base of the phalanx. There may even be some periostitis. If neglected, this condition ends in the deformity known as " dropped finger " or " mallet finger." We have found that at least six weeks' rest on a splint in the position of extreme extension is necessary (*Plate XXIII, Fig. E*) so as to make sure of no subsequent stretching of the tendon and of no deformity. If this treatment is adopted at first, there will be no " adhesions " as a rule; but, if the injury has been aggravated by injudicious movements, it may be necessary to break down adhesions, which must on no account be attempted till after the period of six weeks' rest, or else the inflammatory reaction will be lighted up again.

A somewhat similar condition occurs at the insertion of the ligamentum patellæ into the tubercle of the tibia. Here, however, the tubercle is often a separate epiphysis; hence a flake of bone is frequently

separated with the ligament. The injury is frequently caused by muscular efforts in jumping, vaulting, and kicking. If the condition be not recognized and treated by taking all strain off the quadriceps extensor by fixing the knee in extension, a reaction is caused which takes the form of an osteitis. This is undoubtedly the most common cause of the subacute or chronic form of osteitis which occurs in the region of the tubercle of the tibia, and has received the name of "Schlatter's disease" (*Fig. B*).

A precisely similar condition often occurs from strain of the epiphysis of the os calcis, into which the tendo Achillis is inserted. In this case, it may be necessary to perform tenotomy of the tendo Achillis to secure proper rest of the part (*Fig. C*).

Summary.—There is nothing new in the principles here set forth. The fundamental ideas are found in Hilton's classic work, entitled "Rest and Pain." The methods of absolute rest and fixation, as we now employ them in all conditions of inflammation and disease in the neighbourhood of joints, were practised and taught by Owen Thomas forty years ago. Massage and movement as means of treatment are of unknown antiquity. Nevertheless, there seems to be a considerable degree of doubt as to how these various methods of treatment should be employed in many cases.

Briefly to summarize our present position, we would say :—

1. Massage, that is, various forms of rubbing and vibration, but not movement of joints, is a powerful means of relieving pain, promoting absorption of exudation and of inflammatory products, and improves the nutrition of the tissues. It is beneficial at all stages of treatment ; but, if it cannot be employed without movement of joints, there are cases in which it were better to avoid massage rather than to risk any injudicious movement.

2. All injured tissues require a period of rest to accomplish repair and restoration of function. Too early commencement of movement or of the exercise of their function merely excites inflammatory reaction.

3. Any movement, whether active or passive, which is followed by pain, stiffness, and diminished range of movement, is injudicious and harmful; and these results prove that the inflammatory process is still active.

4. Passive movements and breaking down of adhesions should not be performed until repair is complete and all inflammatory reaction has ceased. When employed, each movement should be made firmly and definitely once, and once only, to make sure that no adhesion or other obstruction has occurred since the passive movement. To-and-fro and irregular movements often stir up an active reaction, and are therefore harmful.

5. When recovery is taking place, active movements should not be too violent at first. The patient is usually the best judge of how much is good for him. Fatigue and pain after movement generally mean that the movement has been too violent or repeated too often.

JOINTS, OPERATIVE TREATMENT OF. (*See* ARTHROTOMY.)

JOINTS, TUBERCULOSIS OF. *Priestley Leech, M.D., F.R.C.S.*
(*See also* ARTHROTOMY, *and* BONE, DISEASES OF.)

Vignard and Armand[1] criticise the treatment of joint and bone tuberculosis by means of injections of iodoform, etc., as recommended by Calot. They consider his deductions much too optimistic. They also draw attention to the bad results sometimes obtained in surgical tuberculosis when operative treatment is undertaken. It is very difficult to maintain an aseptic condition of the parts during the necessarily long course of the treatment; and even at the time of operation many surgeons are not as careful in their antiseptic or aseptic technique as they would be if they were performing an abdominal operation. Drainage, also, is favourable to post-operative infection. They consider that in most cases joint tuberculosis begins in the bone, and involves the joint secondarily. Bony foci cannot be reached by injections, and the authors consider that they are only useful for modifying cold abscesses or glandular tuberculous cavities. In these cases their action is detergent; the pus is evacuated and a slight inflammatory reaction is produced; but they do not believe that the solutions injected have any influence on Koch's bacillus. The good results supposed to have been obtained by these means are due mainly to the immobilization of the joint. They have had very good results with **Mosetig's Bone Plugging.** This is used sterilized in collapsible metal tubes which are warmed before use in order to liquefy their contents. The notes of several cases of tuberculosis of the various joints are given along with the *x*-ray illustrations.

The authors conclude: (1) As tuberculosis, especially the articular form, has a natural tendency towards cure, properly devised immobilization is the method of choice, but it must be carried out for a sufficiently lengthy period. (2) Injections may also be tried, as they have a favourable influence on residual abscesses. (3) In all cases, if a focus of tuberculous osteitis is accessible, it should be operated on. If a tuberculous arthritis becomes worse during five to ten months' immobilization, surgical intervention under certain conditions is the surest and most rapid means of cure. (4) Operations must be most carefully aseptic; the osteo-articular cavities must be filled with Mosetig's iodoform bone plug, and drainage must be avoided. (5) Operation must be reserved for the cases in which there are no fistulous tracks, and where the kidneys are sound. A month later the patient must be sent to reside in fresh air and have the general treatment of tuberculosis.

Hip Disease.—Wilson[2] describes the treatment of hip disease adopted in the orthopædic department of the Jefferson Hospital, by means of a plaster of Paris spica. The plates give an adequate idea of the *modus operandi* and the appliances used. The shoulders of the patient rest on a box or suitable bench, and the sacrum on a pelvic support (*Plate XXIV, Fig. A*). A pair of drawers is then placed on the

WILSON'S METHOD OF TREATING HIP DISEASE

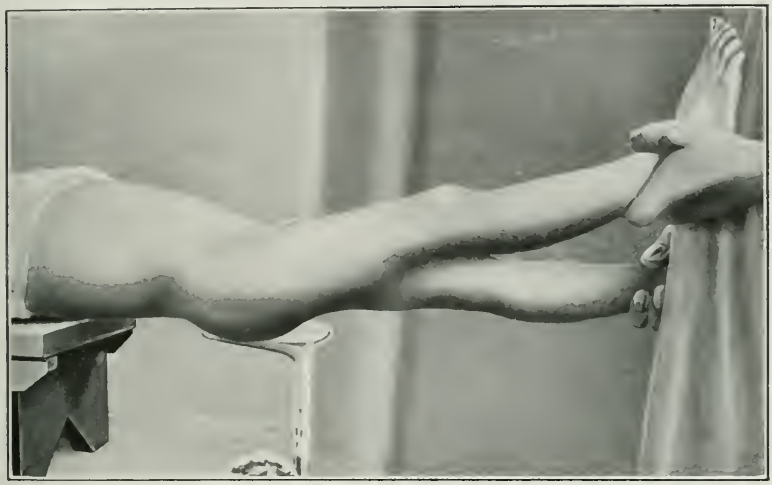


Fig. A.—Position for commencing the Treatment.

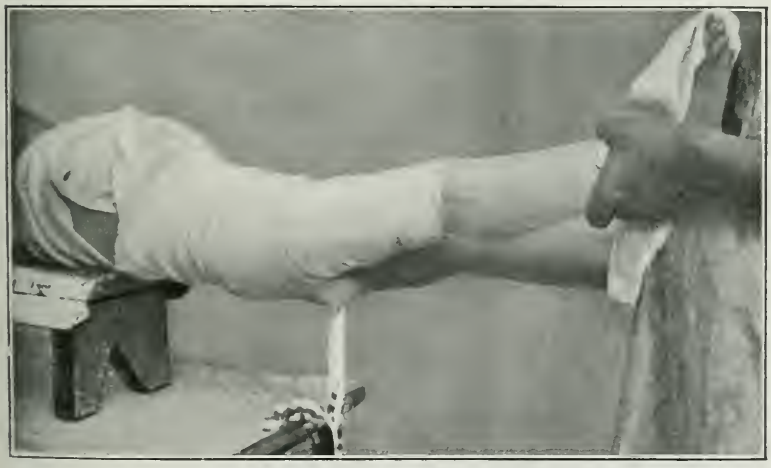


Fig. B.—Bandages applied over the drawers ready for the Plaster.

WILSON'S METHOD OF TREATING HIP DISEASE—*continued*

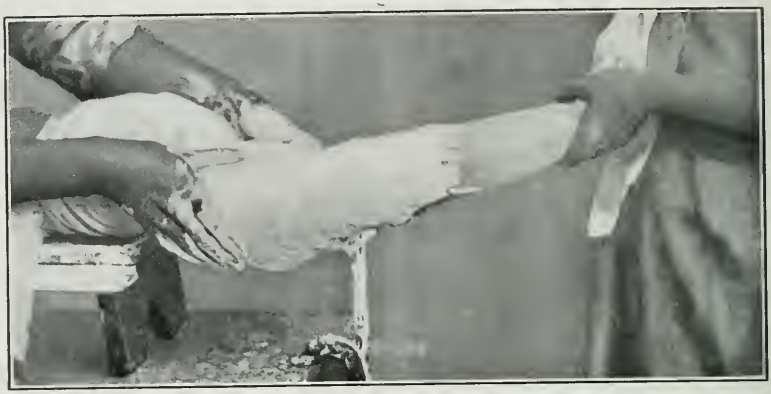


Fig. C.—Method of applying the Plaster.

Fig. D.—The Treatment completed.

patient's legs, and inside the leg of the drawers on the affected side is drawn a 3-in. wide unbleached muslin bandage, the length of which is twice the length of the leg. This bandage is used as a scratcher. Over the drawers on the affected side are rolled cotton-bolting bandages, thick enough to protect the bony prominences. These bandages are made from sheet bolting cut in widths of about four to six inches, the ends being sewn together so as to make a bandage six to eight yards long. A wide gauze bandage is then applied to compress the bolting and fit it closely to the patient's form. The leg is then placed as in *Plate XXIV, Fig. B*, with about 20° of flexion, 20° of abduction, and 5° of external rotation, and this position is maintained by the assistant holding the feet in the manner shown. When the plaster cast is nearly finished and is still soft (*Plate XXV, Fig. C*), it is moulded to fit the bony prominences. When the plaster is set, the edges are trimmed by a knife, and the patient can be put on a couch ; the drawer leg is drawn up over the thigh-piece of the spica, and the material above the waistband is turned over the pelvic part ; the drawer leg of the unaffected side is cut off just above the knee. The whole cast is thus covered with the turned over portions of the drawers, which are then sewn together (*Plate XXV, Fig. D*). The bandage is used for cleaning the skin by alternately pulling on the upper and lower ends, and when soiled a fresh piece can be sewn to the end and pulled through. After 24 hours the cast is dry and the patient can be allowed to walk. At times the spasm of the hamstring tendons and quadriceps femoris is such as to make it necessary to apply the cast to the ankle for the first few weeks, after which time the cast can be cut off just below the condyles of the femur and grooved out in the popliteal space to permit flexion of the leg. If sinuses exist, windows can be cut through which they may be treated by injections, etc. ; but these openings weaken the cast, and it must therefore be strengthened. This method allows of walking, and a limited use of muscles. After a time it may be found that the leg portion of the cast is tight, and the leg swells owing to the increased size of the muscles from use. If this occurs whenever the patient walks, a new cast must be fitted ; even two or three new casts may be needed in the first six months. Weight bearing alone is not injurious in diseased joints ; it is the friction and grinding that are destructive. The children can be sent to the country or seaside and allowed to walk as they like, but opportunities of rest besides the usual night's rest must be provided for. Wilson deprecates any attempt to obtain mobile joints by forcible means where ankylosis has resulted from bony tuberculosis.

Tuberculosis of Ankle and Tarsus.—In children, the treatment of this condition is difficult, and opinions are divided as to the best course to pursue. Murphy[3] recommends excision by an anterior incision across the ankle joint, with division of tendons and subsequent suture. Sever,[4] on the other hand, thinks conservative treatment gives the best results. The joint is fixed in a plaster case reaching from the toes to the knee, a Thomas' knee splint is applied, and the child can walk about with

a high sole and crutches. In adults, the problem is more complicated, and Rogers[5] draws attention to the length of time that a cure by fixation and rest takes. He points out that a man (e.g., a mechanic) cannot leave his work for four years and then be as capable of earning as before. He reviews eighteen cases, in which cure has taken from two to four years at the least, in some over eight years. His opinion is that fixation is not sufficient to control tuberculosis of the ankle joint in adults in a large percentage of cases, and even in mild cases it requires a long period of time. Chronic invalidism, a certain mental condition that is inevitable in patients who are of no use to society, should be avoided. A complete operation with radical removal of the focus should be done before there is much involvement of the various joint surfaces, and an early diagnosis by the *x*-rays is necessary. Amputation was necessary in over 50 per cent of the cases.

References.—[1]*Rev. de Chir.* 1910, 766; [2]*Therap. Gaz.* 1910, Sept.; [3]*Brit. Med. Jour.* 1909, ii, 1146; [4]*Jour. Amer. Med. Assoc.* 1910, ii, 2128; [5]*Boston Med. and Surg. Jour.* 1911, i, 811.

KALA-AZAR. (*See* Leishmaniasis.)

KELOID.

X-ray treatment (*page 77*); **Radium** (*page 80*).

(*Vol.* 1911, *p.* 578)—For moderate keloids after burns, application of a varnish of **Iodoform** in **Collodion** is useful. Injections of **Thiosinamine** very useful.

KIDNEY, SURGERY OF. *J. W. Thomson Walker, M.B., F.R.C.S.*

Examination of Renal Function.—B. A. Thomas[1] reviews the methods in use. The original popularity of **Phloridzin** is fast disappearing. The test is too sensitive, and allows of exaggerated ideas of the extent of renal disease. **Methylene Blue** has fallen into disrepute because of its inconstancy, variability, and prolonged duration of elimination. **Rosanilin** is one of the best dye substances that can be utilized for testing the renal activity; nevertheless it has never attained any popularity. **Indigo Carmine** is better than other aniline substances in respect of its early elimination, constant colour reaction, intense colour excretion, short duration of elimination, and easy application, no ureteral catheterization being required.

Cryoscopy of the total urine alone or of the blood alone is valueless. The **Electrical Conductivity** test is too complex, and the apparatus required too costly, while the results are fallacious unless the diet and intake of fluid are controlled.

Albarran's **Experimental Polyuria** test the author looks upon as fallacious for the following reasons: It is frequently impossible to employ ureteral catheters which completely occlude the male ureters so as to prevent escape of urine alongside the catheter. Two or three hours is an unjustifiably long time to allow the ureteral catheters to remain in situ. The inability of some patients to drink the quantity of water required. The diuretic action of water sometimes fails. The method does not show slight lesions.

PLATE XXVI.

URETERAL CALCULUS AND BILATERAL HYDRONEPHROSIS

Fig. A.—A, calculus in left ureter; B, C, opaque bougie in ureter.

Fig. B.—Kidneys of same case as *Fig. A*. A, left kidney, hydronephrotic and filled with collargol solution; B, upper pole of right hydronephrotic kidney; C, calculus in lower pole of right kidney; D, calculus plugging pelvic outlet; E, edge of psoas.

J. W. Thomson Walker.

PROPORTIONAL RENAL MENSURATION AND PYELOGRAPHY

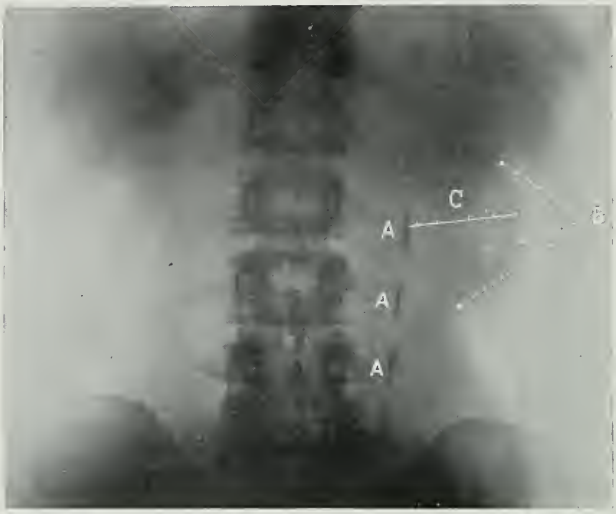


Fig. C.—Thomson Walker's method of measuring the kidney. A, A, A, opaque half inches of ureteric catheter; B, points at edge of kidney shadow; C, half-inch values projected across kidney shadow.

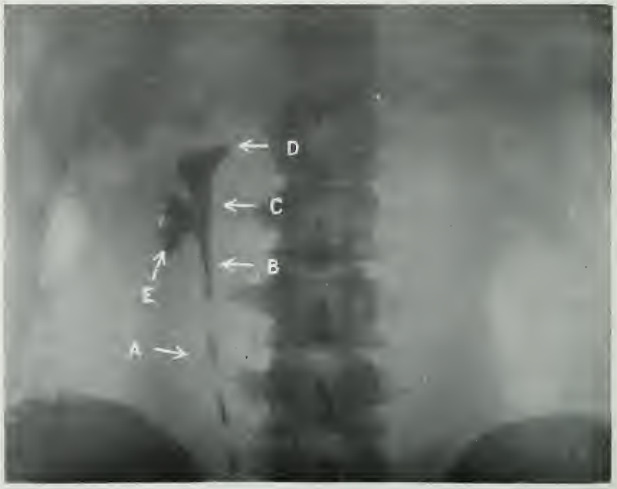


Fig. D.—Pelvis of left kidney injected with collargol. A, ureteric catheter; B, junction of ureter and pelvis; C, dichotomous pelvis, D, E, calyces.

J. W. Thomson Walker

PLATE XXVIII.

PYELOGRAPHY

Fig. E.—Pelvis and ureter filled with collargol. A, collargol in ureter; B, junction of ureter and pelvis; C, funnel-shaped pelvis; D, opaque catheter in right ureter

Fig. F.—Right movable kidney. Pelvis injected with collargol. A, opaque catheter in ureter; B, C, angling of uretero-pelvic junction; D, dilatation of upper calyx.

The **Phenolsulphonephthalein** test has been studied by Rowntree and Geraghty. Synchronous bilateral catheterization of the ureters is necessary. The patient drinks 600 to 800 c.c. of water previous to the administration of the drug. One c.c. of solution containing 6 mgrams phenolsulphonephthalein is injected subcutaneously, and the urines are collected in test tubes each containing one drop of 25 per cent NaOH. The drug in acid urine produces an orange-yellow colour, but in alkaline solution is transformed into a brilliant amethyst-red. In addition to noting the onset of elimination, stress is laid on the quantitative percentage elimination of the drug during the first two hours after injection. Thomas has compared the value of this drug with indigo-carmine, and finds that the initial onset of its elimination by the kidney is delayed approximately twice as long as indigo carmine, and that during the fourth hour after injection the percentage of excretion of phenolsulphonephthalein was over three times that of indigo-carmine. The sole advantage over indigo-carmine lies in the smaller amount used for injection.

Pyelography.—Thomson Walker[2] points out that although plastic operations upon hydronephrosis and pyonephrosis are successful in preserving what remains of the secreting tissue, the organ cannot be restored to its normal state. (*Plate XXVI, Figs. A, B*). The proper time for operation in these cases is when dilatation is commencing, and the surgeon should endeavour to recognize this stage in order to save the kidney.

It is not possible by symptoms alone to make a diagnosis of early dilatation of the kidney. Aching pain may be present, but is common to other diseases. Polyuria, if recognized, is an important symptom, but it is frequently transient and often overlooked. Kelly's method of estimating the capacity of the renal pelvis by measuring the fluid which can be injected by means of a ureteral catheter, is open to the fallacy that fluid may escape alongside the catheter, and that it is difficult to empty the pelvis completely through a fine-bore catheter while polyuria is in progress. And further, there are widely divergent views as to the normal capacity of the pelvis.

An experienced radiographer can show the outline of the kidney, but it is difficult to estimate slight enlargements. The author finds that the following measurements (proportional renal mensuration) will show the outer limit of the normal kidney and demonstrate slight enlargement: "If the narrowest transverse measurement of the shadow thrown by the twelfth dorsal vertebra be taken, and this measurement doubled and projected transversely from the outer edge of the vertebral body at its middle, a point will be found. If the same measurements be made in regard to the first and second lumbar vertebræ, two other points will be obtained. By joining these three points the outer border of the normal kidney is roughly indicated." Further, he measures the exact size of the kidney by the following method: Ureteric catheters with an alternate opaque and translucent band, each of which is half an inch, are passed along the ureter to the

kidney. The opaque and translucent bands show in the same plane as the kidney, and the relative shadow value of half an inch is obtained. By marking a piece of paper in half-inch values, and laying it across the kidney shadow, the actual size of the kidney is found (*Plate XXVII, Fig. C*).

Pyelography gives very accurate information in regard to dilatation of the kidney. The author uses 10 per cent collargol, which is slowly injected into the renal pelvis. When the pelvis is full, the patient usually feels pain, but this varies in different individuals. It is important to avoid producing renal colic, as the tense rigid muscles obstruct the *x*-rays. This is prevented by a morphia injection. By means of the shadow thus obtained, angling of the pelvo-ureteral junction can be demonstrated, and the shape and size of the pelvis shown. Dilatation of a single calyx, or of groups of calyces, total obliteration of the calyces, or complete dilatation of the kidney, may be seen (*Plate XXVI, Fig. B; XXVII, D; XXVIII, E, F*).

Lichtenberg and Dietlen[3] have practised in a few cases the inflation of the renal pelvis with oxygen in order to assist radiographic diagnosis. They have found that in cases where there is a doubt as to the presence of a stone shadow in a radiogram, this method shows the outline of the pelvis, and in the clear area a stone shadow, if it be present, is readily recognized and defined. They have found no ill effects from the method, and hold that there is no danger of oxygen embolus.

Renal Tuberculosis.—Newman[4] says that the premonitory *symptoms* which call for a minute physical examination are polyuria and frequent micturition, at first without pain; persistent slight pyuria and albuminuria in acid urine without tube-casts; occasional hæmaturia with comma-shaped clots in the urine. The most characteristic feature of the symptoms is their tendency to remissions. In this lies a serious danger; the patient and the medical attendant may be led astray by the hope that all is well.

The discovery of *tubercle bacilli* in the urine in early diseases of the urinary tract points to the cause, not to the gravity and extent, of the lesions. Their presence in the urine does not necessarily signify disease of the urinary tract. Newman pointed out eleven years ago that they may be eliminated by the kidney without infecting the tissues through which they pass. It is often difficult to find them in urine where they are few, or where putrefactive bacilli are also present. Inoculation experiments help to clear up the diagnosis. The Calmette ophthalmo-tuberculin reaction is valuable in certain cases.

According to the author, segregation of the urine should not be employed if it can be done without. He holds that the *cystoscope* alone, without the assistance of the ureteric catheter or the separator, can supply as much information, a claim that few modern urinary surgeons will endorse. The author concludes that when the orifice of the ureter is strictly normal, no serious disease exists in the corresponding kidney. When there is evidence of tuberculosis at the orifice of the ureter, there is always associated with it tuberculosis of the corresponding kidney.

In regard to the possibility of *spontaneous cure* without operation, he states that the nearest approach is complete disappearance of the tuberculous material and its replacement by fibrous tissue which contains no infective material. He has met with "quite a number of cases post mortem where favourable terminations have been observed in tuberculous lesions of the kidney." Later on, however, he says, "In all cases of primary renal tuberculosis the problem must be seriously placed before him (the patient) and nephrectomy advised."

Vineberg,[5] discussing *renal tuberculosis in women*, finds that operative renal tuberculosis is more frequently met with in women than in men. Renal tuberculosis is seldom or never associated with tuberculosis of the genital organs. It is frequently overlooked in women and erroneously diagnosed as catarrhal cystitis. The prognosis of operative interference is better in women than in men. Removal of a tuberculous kidney in women is no bar to marriage or to bearing children.

Fibrosclerotic Paranephritis — Zuckerkandl[6] states that every suppurating kidney enclosed in a thick fibrous mass may be looked upon, without using any method of functional examination, as being the seat of unilateral disease, and the only rational treatment consists in removal of the kidney together with the fibrous mass. This is extremely difficult, and Zuckerkandl holds, with most authorities, that the nephrectomy should be intracapsular. Where nephrostomy and nephrotomy were performed, there were cases of recurrence and death, but all the cases of nephrectomy were successful. The chief difficulty is at the hilum of the kidney after separating the organ from its envelope. The pedicle is short, thick, and rigid, so that the kidney cannot be raised into the wound. There are several methods of dealing with the vessels under these conditions. The kidney may be removed piecemeal, and the vessels at the hilum clamped and then controlled by the insertion of strong mattress sutures. Sometimes only one or other pole prevents access to the pedicle, in which case it is removed in the neighbourhood of the hilum, after which the pedicle is accessible. The fibrous mass is incised with a knife all round the neck of the pedicle, and in the groove thus formed small clamps are applied and the pedicle cut across on the kidney side of these. If the pedicle is broad, so that a single pair of clamps is insufficient, the segment belonging to the first pair is cut through, and then another pair applied until the whole is cut through. The scar tissue around the pedicle is so friable that the usual form of ligature does not suffice; Zuckerkandl therefore uses mattress sutures.

New Growths.—In 1896, Professor Israel recorded a case of fever in a malignant growth of the kidney, and suggested that a specific fever might be observed in this disease. In the present article[7] this theme is developed. All causes of fever from septic complications or other diseases, such as malaria, are excluded. Diagnosis is especially difficult where the growth fever is unaccompanied by any other symptom. Israel has seen such a case attributed to tuberculosis of the lung or bronchial glands without physical signs. These febrile

cases formed 8·2 per cent of this author's operation cases of renal and suprarenal growth (12 in 146).

The fever may appear at different periods of the course of renal growths, and may be initial, intercurrent, or terminal. It usually assumes one of three types: (1) Remittent or intermittent fever, giving the clinical picture of hectic fever and lasting for many months, (2) Recurrent fever with regular periods of five or seven days of normal temperature; (3) Attacks of fever related to hæmaturia, either preceding the hæmorrhage and disappearing when the blood appeared, or following an attack of hæmaturia. In some cases there is high fever initiated by a rigor, in others there is a slight rise that would scarcely be looked upon as abnormal were it not that the temperature became normal after nephrectomy. The fever disappeared after nephrectomy where the growth was completely removed, but continued, or was but slightly influenced, in cases where the operation was incomplete. Fever appeared where metastases developed, or where a sudden increase in the local growth took place.

In discussing the nature of the substance which produces the fever, Israel says: "We only know so much about the cause of the fever as to say that it is a product of malignancy independent of the special histological structure and unconnected with secondary changes, such as result from degeneration of the growth or the processes of disintegration caused by micro-organisms." Finally, Professor Israel discusses the important question whether any conclusion in regard to prognosis after nephrectomy can be drawn in febrile cases. In his experience, the immediate result of the operation is less favourable than in the afebrile cases. In regard to later results, it may be judged that fever is an unfavourable symptom, since rapid growth, metastatic deposit, or spread of the growth beyond the limits of the kidney is common in these cases.

Renal Pain.—Hurry Fenwick[8] states that the commonest cause is dilatation of the renal pelvis. The pain is first felt in the hollow of the loin at the angle formed by the last rib and the erector spinæ muscle. As the distention increases, there is abdominal pain over the front of the same side, and finally sharp renal colic. The attack is shorter than real renal colic and more amenable to treatment. There is also dragging pain on the renal vessels, relieved by lying down and by wearing a kidney belt. When infection takes place there is more severe, continuous, and radiating pain, which is less easily relieved by rest and morphia, and bladder symptoms usually appear also. When the distention is more marked the patient sleeps on the painful side, and there is occasionally violent thirst.

Urinary Calculi.—Temple Mursell[9] discusses the incidence of urinary stone in South Africa, and states that renal calculus is more frequent than vesical calculus. In the Johannesburg Hospital there had been nine cases of stone in the bladder, and fourteen of stone in the kidney. Two cases illustrating referred pain from one kidney to its neighbour were related. In one there had been left renal colic of two

days' duration, followed by tenderness in the left loin. There was a history of right-sided renal pain extending over twenty years, with passage of calculi, pus, and blood. The *x*-rays showed a renal calculus on the right side, which was removed by operation, and there has been no further sign of calculus. In the second case there was right renal colic, and tenderness and rigidity over the right kidney. The left kidney region was tender but painless. There was a history of renal pain and colic on the left side of two years' duration, with the passage of blood, pus, and calculi. There were symptoms of uræmia. The right kidney was explored, and found healthy and hypertrophied; the left was pyonephrotic, and contained large phosphatic stones.

Pyelonephritis.—During the last few years much careful work has been done in the pathology of pyelonephritis, so that it has been possible to differentiate two forms of suppurative nephritis: (1) Suppurative nephritis without evident pre-existing disease of the urinary tract; and (2) Suppurative nephritis superimposed upon a previously diseased urinary tract, especially those cases where there is long-standing obstruction and inflammation in the lower urinary tract. Thomson Walker[10] gives an account of the first type.

The impression given by writers upon the subject is that the preponderance of females over males is overwhelming. The actual facts do not show this to be the case, although there is no doubt that the female cases preponderate. Clinically, the cases are divided into mild, severe, and "fulminating." If the after-history of mild and acute cases that recover is followed, it will be found that a considerable proportion (about 50 per cent) become chronic. Mild cases frequently recover completely, and the urine becomes sterile. The following conditions have remained in cases where recovery from the first attack is incomplete: (1) Bacilluria; (2) Bacilluria with pyelitis and occasional attacks of cystitis, or with slight chronic cystitis; (3) Persistent subacute pyelonephritis and cystitis; (4) Mild chronic pyelonephritis. In any of these conditions an acute attack of pyelonephritis similar to the first attack may recur after months or years (six, ten, or twelve years). In cases where there is bacilluria alone, or with slight pyelitis or cystitis, the patient may be unable to give clear information in regard to the conditions of the urine since the previous attack, and the symptoms may have been so slight as to be almost unnoticed, so that there is apparently an interval of complete health between two attacks. Unless the urine has been bacteriologically examined, it is impossible, however, to exclude latent infection. The number of cases in which this is known to exist leads one to the view that those which are apparently examples of two or more attacks of pyelonephritis in a patient unduly susceptible, are really examples of acute exacerbations in latent urinary infection of many years' standing. The source of the infection is, in the great majority of cases, the bowel; and after reviewing the literature and evidence in regard to the path of infection, the author concludes that it is hæmatogenous.

Medicinal treatment has the object of preventing further infection

from the intestine, reducing the acidity of the urine, and rendering it antiseptic. The bowels are cleared by a brisk **Purge,** and this is followed by small daily doses of **Calomel** ($\frac{1}{20}$ to $\frac{1}{6}$ gr. t.d.s.) continued for some weeks. **Urotropin, Helmitol,** and **Hetraline,** the best urinary antiseptics, are given in doses of 15 to 30 gr. daily, and in proportionally smaller doses in children. **Citrate of Potash** in doses of 24 to 48 gr. a day may be given even in young children, and may be combined with **Digitalis.** This renders the urine neutral or slightly alkaline, and should be continued until all danger of relapse is past. The cases suitable for medicinal treatment are mild cases in adults and practically all cases in children.

Vaccine treatment consists in the administration of graduated doses of dead bacteria. The doses commence with two million, and advance to as high as 200 million. In acute pyelonephritis the results have not been satisfactory. Treatment by injection of **Antitoxins** contained in the serum of inoculated animals has been tried. Dudgeon treated twelve cases and obtained satisfactory results "in most instances." In five cases the effects of the serum were rapid and permanent, in four considerable benefit ensued, in two there was no improvement, and in one patient there were very severe joint pains and rashes. He recommends the administration of **Calcium Lactate** in doses of 20 gr. three times daily to diminish the liability to joint pains and rashes.

In forty cases of **Operation** collected by Thomson Walker, seven died and thirty-one recovered, while in two there was no change. In acute cases in adults the following questions will certainly arise: Should an operation be performed? And if so, when? And what operation? In fulminating cases it is unlikely that operation will be of avail. These cases occasionally recover, without interference, in the most unexpected manner; but if the diagnosis is clearly established, operation should not be withheld, and may save an almost moribund patient. In acute cases in adults recovery may take place, but the prognosis is very bad without some form of surgical interference. It will usually be possible to tell by the end of five or seven days at latest whether operation is necessary. A large tender kidney, with recurring rigors or persistent high temperature at the end of this time, should be operated on. The form which operation should take is open to discussion. The immediate results of nephrotomy in recorded cases are very bad, and the after-results are not good, for secondary nephrectomy is frequently required, and is sometimes performed when the patient is weakened from long-continued suppuration. The best results have been obtained by nephrectomy in the acute stage. Every care should be taken by cystoscopy, and if necessary by catheterization of the ureters, to ascertain the presence and health of the second kidney.

Operative Technique.—Kelly[11] has at intervals used a "*transrenal plan of nephrolithotomy,*" which, except in the simplest cases with an easy exposure, is, he believes, quicker and safer than pyelotomy or any other transperitoneal operation. A ureteral catheter, large enough

to occlude the ureteral orifice and prevent the reflux of fluid into the bladder, is passed and introduced well up to the kidney. The kidney is exposed, and an assistant forces fluid (1–1200 silver nitrate) into the renal pelvis till it is tensely distended. The surgeon now incises the capsule on the posterior surface of the kidney, and plunges a blunt-pointed and blunt-edged knife through the cortex into the renal pelvis, and enlarges the opening transversely. The finger is introduced and the stone removed. The author claims that there is a minimal amount of damage to the kidney, that this part of the organ is easily accessible, and that the distention renders incision and exploration of the pelvis easy.

Much work has recently been done in investigating the *damage done to the kidney by operations*. Moore and Corbett[12] contribute an article on this subject, and draw the following conclusions from their experimental work: Section of the kidney does less harm than the sutures introduced to control hæmorrhage. Mattress sutures destroyed a great deal of kidney tissue, while interrupted sutures transfixing the kidney at the pyramidal line and tied around the body of the kidney did the least damage. Enlargement of the unoperated kidney after a short time was due to congestion from overwork and not to increase of renal substance. The functional activity of the operated kidney was somewhat reduced.

Since 1907, W. J. Mayo[13] has used, and now advocates, the formation of a *flap of fatty tissue* to cover the incision in the renal pelvis *after pelviotomy for calculus*. This operation, he believes, should be used in all cases where stone is confined to the pelvis of the kidney, the object of the fatty fascial flap being to obtain rapid convalescence without urinary leakage. There is frequently a considerable increase in the fatty tissue covering the pelvis in calculus; and in these cases the fat is not removed, but the incision made through it as part of the wall of the pelvis, and afterwards sutured with the pelvis. If the opening in the pelvis is large and irregular from tearing, a flap of fatty fascia can be made from the vicinity and turned across to protect the line of suture. It is not necessary to suture this closely, but merely to place it over the point to be protected and fix it with two or three catgut sutures. In 1906, Thomson Walker[14] published a case in which he had used a flap of kidney capsule turned down over an incision in the renal pelvis to complete a plastic operation, and he recommended the use of this method for the closure of wounds in the renal pelvis.

Movable Kidney.—Reed[15] has employed *extracapsular fixation* since 1904, using the following method: The adipose capsule of the kidney is exposed by the usual oblique lumbar incision, and is carefully separated from the abdominal wall, care being taken not to separate the tunica adiposa from the tunica fibrosa. The kidney, surrounded by its tunica adiposa, is raised to the surface, the upper pole being first delivered. The "globular fat" is now wiped away with gauze from the connective tissue stroma of the adipose capsule,

and the stroma is found arranged in distinct parallel striæ extending obliquely downward and forward from the lower pole of the kidney. Vigorous friction is now applied with gauze to the tunica fibrosa at the upper pole until small punctate hæmorrhages appear. Any fat still adherent to the abdominal wall is now removed and the kidney returned to its bed. The connective-tissue striæ of the adipose capsule are divided transversely about an inch below the lower pole of the kidney, and the stump adherent to the kidney is stitched by chromicized catgut to the inner surface of the lower margin of the operation wound, while the lower stump is similarly attached to the same spot. The wound is then closed. This operation makes use of the connective-tissue striæ of the adipose capsule, and of the special band of these striæ which pass from the lower pole of the kidney to the cæcum or sigmoid flexure which has been called the nephrocolic ligament. The procedure "is designedly extracapsular, because its object is to restore the kidney as nearly as possible to its original relations and normal attachments."

In an inquiry[16] into the *after-history* of thirty cases of movable kidney treated by operation at the Bristol Royal Infirmary, A. R. Short found the following results:—

Operation	Cases	Cured	Considerable Relief	Little or no Relief	Died
Transcortical Suturing	14	9	1	4	0
Suturing of Capsule	8	3	1	3	1
Carbolic Acid and Gauze Sling.. ..	8	5	1	2	0
	30	17	3	9	1

The patients were well pleased with the result in twenty cases. One source of failure was slipped kidney; this occurred in two cases after transcortical suturing, and twice after suturing the capsule only. Care must be exercised in deciding that a kidney has really become loose again. In many cases the kidney is fixed lower than its normal position, and it may move an inch or two with respiration, and even allow the hands to meet above it without becoming abnormally mobile. Another source of failure, as Short points out, is erroneous diagnosis, the symptoms being really caused by trouble in the stomach, appendix, or ovary, or general enteroptosis.

Aberrant Renal Arteries.—McDonald[17] contributes an article on anomalous renal arteries and their relation to hydronephrosis; and Eisendrath and Strauss[18] discuss the surgical importance of accessory renal arteries in respect to the occurrence of severe hæmorrhage in performing nephrolithotomy.

Under normal conditions each kidney is supplied by a single renal artery which rises from the aorta, and before entering the hilum of the kidney divides into three to five branches. The most frequent

varieties of accessory arteries are: Two separate renal arteries which enter the hilum; (2) A normal main artery, and an accessory artery from the aorta which passes to the upper pole; (3) A similar artery passes to the lower pole; (4) Three renal arteries pass separately to the kidney from the aorta; (5) Four renal arteries arise from the

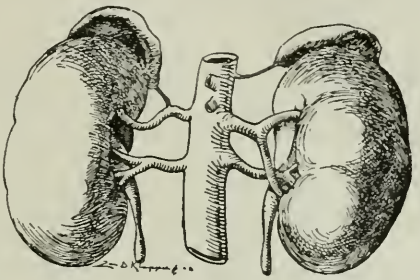


Fig. 94.—Two separate arteries passing from aorta to hilum.

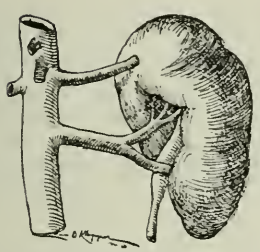


Fig. 95.—Large artery from aorta to upper pole.

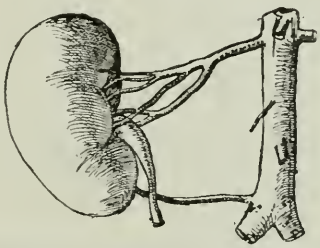


Fig. 96.—Large artery from aorta, close to bifurcation, to lower pole.

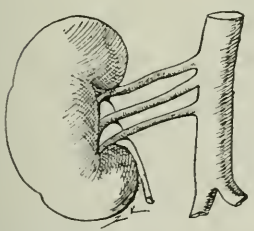


Fig. 97.—Three separate arteries from aorta to hilum.

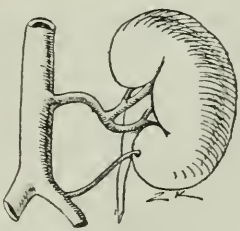


Fig. 98.—The accessory artery has its origin from an extra-aortic artery like the common or external iliacs.

Figs. 94 *to* 98.—Various Types of Accessory Renal Arteries.

aorta; (6) The accessory artery arises from the common, external, or internal iliac arteries, spermatics, inferior phrenic, lumbar, pancreatic, or colonic arteries; (7) The superior or inferior polar branches arise from a normal renal artery (*see Figs.* 94–98). Eisendrath and

Strauss examined both kidneys in 100 bodies, and found accessory arteries in 14 per cent and normal arteries in 86 per cent, two renals in 7 per cent, superior polar in 3·5 per cent, and inferior polar in 2·5 per cent. According to McDonald, accessory or abnormal renal veins are even more common than abnormal arteries.

The relation of aberrant vessels to *hydronephrosis* is still under discussion. In a recent paper by Mayo[19] aberrant renal vessels were found in twenty out of twenty-seven cases of hydronephrosis, and in thirteen of these, simple division of the vessel was sufficient to relieve the condition. Gardner[20] believes that such vessels cause hydronephrosis by pressure upon the ureters in three ways: intermittent pulsation of the artery, continuous pressure by the vessel, or kinking of the ureter on the vascular cord. It is admitted, however, that in many cases of hydronephrosis the aberrant vessel has only an accidental relationship to the hydronephrosis, and is not the primary factor.

Dilatation from any cause, inflammatory adhesions about the pelvis or ureter, or mobility of the kidney, may, if associated with an aberrant vessel, lead to further changes.

For **X-ray** diagnosis of renal calculus and other affections, *see page* 68.

References.—[1]*Ther. Gaz.* 1911, 80; [2]*Lancet*, 1911, i, 1627; [3]*Münch. med. Woch.* 1911, 1341; [4]*Pract.* 1911, 8; [5]*N.Y. Med. Jour.* 1911, i, 1068; [6]*Wien. klin. Woch.* 1909, 1440; [7]*Deut. med. Woch.* 1911, 57; [8]*Brit. Med. Jour.* 1911, i, 8; [9]*S. Afr. Med. Rec.* 1910, 285; [10]*Pract.* 1911, 655; [11]*Jour. Amer. Med. Assoc.* 1911, i, 19; [12]*Ann. Surg.* 1911, 373; [13]*Surg. Gyn. and Obst.* 1910, Ap., in *Ther. Gaz.* 1910, Aug. 15; [14]*Lancet*, 1906, Aug. 11; [15]*Jour. Amer. Med. Assoc.* 1910, ii, 989; [16]*Brit. Med. Jour.* 1911, i, 682; [17]*Ann. Surg.* 1910, 814; [18]*Jour. Amer. Med. Assoc.* 1910, ii, 1375; [19]*Ibid.* 1909, May 1; [20]*Ann. Surg.* 1908, Oct.

KNEE-JOINT, SURGICAL TREATMENT OF.

(*See* Arthrotomy.)

LABOUR.

Victor Bonney, M.S., M.D., B.Sc., F.R.C.S.

Cæsarean Section.—An important paper has been published by Routh[1] on Cæsarean section and its alternatives in women who have been long in labour and exposed to septic infection. He emphasized the enormous difference in the operative mortality of Cæsarean section as applied to "clean" and "suspected" cases respectively. For this purpose he collected 1282 cases performed by many surgeons over a long period of years. He found a death-rate of 2·9 per cent in cases in which the membranes were unruptured at the time of operation, as against a mortality of 17·3 per cent where rupture had already occurred. To lessen this high mortality in "suspect" cases, Cæsarean hysterectomy, symphysiotomy, pubiotomy, and extraperitoneal Cæsarean section have been introduced at various times.

Extraperitoneal Cæsarean section was described by its inventor, Sellheim, in the *Medical Annual* of last year. Routh does not think favourably of this proceeding, remarking that presuming the case is already infected, the operation still leaves the uterus with its placental site as a seat of potential septic absorption, while a very large area of cellular tissue is opened up to possible infection. He remarks that

while the alternatives to Cæsarean section named are each recommended by their votaries, there is some Continental support for the view generally held in Great Britain, that admittedly infected cases are better treated by Cæsarean hysterectomy or embryotomy. The difficulty lies in most cases in diagnosing infection before operation, for there is no clinical method by which, in the absence of pyrexia or offensive discharge, the presence of organisms in the uterus can be proved.

Bumm subjects the liquor amnii of all "suspect" cases to microscopical investigation, and if organisms are found, embryotomy is performed. If no organisms are found, extraperitoneal Cæsarean section is carried out with drainage of the uterus (see Sellheim's article in the *Medical Annual* of last year). Routh had a series of cases investigated as to the bacteriological content of the liquor amnii, and found that on the whole the results obtained from immediate "smear" preparations were borne out by subsequent culture results.

On considering the *indications for treatment*, the cases may be divided into groups: (1) Cases exposed to infection with membranes intact. Here the organisms present in the vagina should be capable of being destroyed or rendered harmless by copious vaginal antiseptic douches, after which the classical operation can be done. (2) Membranes ruptured, liquor amnii sterile, no fœtor or fever, but previous exposure to infection. Here also the classical operation can be performed. (3) Membranes ruptured, saprophytic organisms found in the liquor amnii, which is possibly offensive. Here craniotomy or Cæsarean hysterectomy is indicated in Routh's opinion. He refers at this period to Maxwell's suggestion of irrigating the amniotic sac in suspected cases, and speaks highly of it, as in any event "diluting the dose" of the organisms. (4) Pathogenic organisms present in the liquor amnii; constitutional evidence of infection. In these cases the alternatives are craniotomy and Cæsarean hysterectomy. Of these the latter is probably the best course, because it removes the infected uterus.

As regards Cæsarean hysterectomy, this may be total or subtotal. In the latter course the infected cervix should be disinfected as far as possible by a strong antiseptic application, or should be drained by gauze packed through it into the vagina. Another method of attaining the same end would be by fixing the cervical stump in the abdominal wound, the original operation of Porro. Routh himself favours total hysterectomy.

This important paper was followed by a discussion.[2] Tweedy spoke highly of pubiotomy as an alternative to Cæsarean section in suspect cases. He also looked favourably on extraperitoneal section of the uterus. Briggs limited the practice of Cæsarean section to clean cases. Eden favoured the classical operation even in suspect cases, and thought well of Maxwell's method of intra-amniotic irrigation. He suggested endeavouring to push the placenta and membranes into the vagina, after extraction of the child. Arnold Lea

remarked that, at St. Mary's Hospital, Manchester, "suspect" cases, i.e., those in which forceps had previously been applied, were frequently treated by the classical operation. There had been one death in sixteen such cases. In cases of infection, proved either by the finding of streptococci in the liquor amnii or cervix, or by reason of the symptoms, total abdominal hysterectomy was the only safe plan. H. Spencer deprecated Cæsarean section in cases in which severe forceps traction had already been applied. In such, the child's life was seriously compromised. It was wrong not to do craniotomy in such cases. He did not think that either extraperitoneal section, pubiotomy, or symphysiotomy should be performed in infected patients. In regard to the first of these, many operative disasters were on record.

If gonorrhœal infection were present, total hysterectomy was the best course, and he apparently held the same view as regards streptococcal infection. Neither he nor Lewers, who subsequently spoke, considered intra-amniotic irrigation practical. Gow favoured perforation of the child's head if its life had already been seriously endangered. If the classical operation were done, the uterus should be eventrated before it was incised, and every precaution taken to avoid fouling of the peritoneum or wound with liquor amnii. Maxwell described his method of **Intra-amniotic Irrigation.** A soft pewter douche tube was passed up to the fundus of the uterus, past the child's head, and normal saline solution at a temperature of 105° F. was allowed to flow for five minutes. The uterus was then eventrated, and a fundal incision made, after packing off the peritoneal cavity. He would not hesitate on ethical grounds to sacrifice a living fœtus in utero in the presence of the clinical signs of sepsis.

Leathem, speaking from the point of view of a bacteriologist, said the attempt to recognize pathogenic organisms in films made direct from swabbings would probably come to this, that the presence in the films of Gram-positive cocci, unless they were obviously sarcinæ, or the presence of Gram-negative bacilli, would lead to the idea that dangerous infection was present, and that this view might lead in some cases to measures that were unnecessary.

The outcome of this important discussion was to show that considerable divergence of opinion exists amongst authorities as to the best routine method of treating infected or suspectedly-infected cases of obstructed labour. The balance of judgment is, however, in favour of Cæsarean section, with eventration of the uterus and protection of the peritoneum and wound, in cases of suspected infection ; and of Cæsarean hysterectomy in cases of undoubted infection. Craniotomy is rightly considered a justifiable alternative in either case ; but especially under the latter circumstances.

Russell,[3] writing on extraperitoneal Cæsarean section, describes briefly the chief methods of performing the operation. He considers the operation to be indicated in cases of contracted pelvis that have been long in labour and have the lower uterine segment stretched, and yet have been apparently preserved from infection, as well as those in

which infection is probable. In this latter class the formation of a temporary communication between the uterus and abdominal surface for purposes of drainage is a valuable resource. He admits, however, that the operation has not fulfilled the original expectation of some, that it would be available with comparative safety in undoubtedly septic cases.

Pubiotomy.—Freeland[4] reports nine of these operations performed at the Dublin Rotunda. Five were carried out by Döderlein's semi-open method, and four by Bumm's subcutaneous method. Of the two the latter is simpler, more aseptic, and less liable to complications. As indications for the operation, he states that the os should be fully or almost fully dilated, the child alive, and the *c.v.* 7 cm. or more. If, then, maternal or fœtal distress is manifest, pubiotomy should be performed. The special merit of the operation is that it affords a means of delivery for a woman with a comparatively slight degree of contracted pelvis.

In Döderlein's procedure there is greater risk of injury to the pre-vesical plexus of veins. The patient in either operation lies in the cross-bed position with her legs hanging down (a modified Walcher's position); assistants at either side prevent too sudden and too much separation of the bones.

Contrary to the opinion of some authorities, Freeland states that there is nothing to lose and everything to gain by immediate delivery, which is easily accomplished by forceps or version. Bumm's sharp needle tends to bury itself in the bone, and in liberating it the bladder may be injured. If Döderlein's operation be done, the wound above the pubes must be closed by suture. In Bumm's method the stab holes are covered by collodion or wool. After either, a broad canvas belt, 8 in. wide, is firmly applied round the pelvis, and the bladder is catheterized every eight hours for twenty-four hours, during which time the patient is kept on her back. She is then moved from side to side until the third day, after which the patient moves herself. The bowels are open on the third day, and the patient is lifted on the bed by the belt for the bed-pan or other purposes, easily and without pain. Of the nine patients, seven have been followed up. All of them have been able to work and walk as well as ever. Five have been delivered since the operation, four very easily and naturally. *X*-ray photography showed bony union in three, and fibrous union in two cases.

Channing Barrett[5] much prefers the subcutaneous method of Bumm, but uses a blunt needle. This is introduced through a small stab made by a scalpel, and is liberated by the same means. He threads the needle when introduced, with heavy silk, which in turn is attached to the Gigli's saw. He approves trying the effect of forceps traction before dividing the bone; but in all cases in which it is unlikely to succeed, he would pass the needle and place the silk in position, so that the saw can be immediately drawn into place if section of the bone is required.

Von Herff,[6] on the other hand, discountenances the operation, on

account both of maternal mortality and morbidity. He strongly recommends induction of labour in all cases in which it is feasible; but admits that a considerable number of these premature infants die within two weeks.

Air Embolism during Labour.—Campbell[7] reported two cases in which the chief features were transitory attacks of distress, dyspnœa, cyanosis, and convulsions, which coincided and recurred with contractions of the uterus during the third stage of labour. He believes the condition to be explained by the maintenance of the semi-prone position after delivery of the child. This position induces a flow of air into the uterine cavity, which is the more marked if the patient have been anæsthetized and her abdominal wall relaxed. So long as the placenta remains detached, nothing happens, but so soon as it gets displaced into the lower segment and cervix there is a danger of its occluding the exit of the uterus, with the result that the next uterine contraction, unable to expel the air downwards, forces it into the veins of the placental site.

The symptoms are very similar to those due to embolism by detached blood-clot, but differ in their transient character (the air embolus being rapidly broken up), and in their occurrence with each uterine contraction.

Treatment.—Dorsal decubitus should be employed in every third stage. If the characteristic symptoms supervene, the placenta should be immediately extracted by hand. Expression from above is absolutely contraindicated, as it may cause another embolism. The uterus should then be irrigated, and the same measures taken as would be used in a case of embolism due to blood-clot. The paper is an interesting one. The author details two cases, both of whom recovered. For this reason the fact that the symptoms were due to an embolism is unproven, but the argument seems very reasonable.

Placenta Prævia.—Cragin,[8] who opened a discussion on the *treatment* of placenta prævia at the American Gynæcological Society, described the chief methods in use at the Sloane Hospital for Women. These were Braxton Hicks' bipolar version, tamponage of the vagina, and the Voorhees' bag. In regard to the last, the largest size was introduced, and after a good dilatation of the cervix had been obtained the child was delivered, either by internal version or by forceps. The introduction of the bag was extra-ovular. Statistics bearing on the total number of cases in 25,000 deliveries showed that the use of the bag had reduced both the maternal and fœtal mortality. He believed that occasionally Cæsarean section was indicated as the best treatment, but he personally had not met with a case. E. Davis believed that in cases of central placenta prævia Cæsarean section was the correct treatment. Clifton Edgar favoured cervical and vaginal gauze tamponage as an efficient means of controlling hæmorrhage and obtaining dilatation of the cervix. Fry approved manual dilatation of the cervix and bipolar version, but thought that in central attachment of the placenta complicated by an undilated cervix, Cæsarean

section was the best course. Excessive loss of blood before the opportunity arose for performing the operation contraindicated it. Norris believed that Cæsarean section was indicated in about 5 per cent of the cases in primiparæ. The ideal conditions for it were a rigid cervix, a viable child, and a patient in comparatively good condition. Whitridge Williams had used Champetier's bag almost exclusively, and had had no maternal deaths. He deprecated manual dilatation, and thought that the necessity for Cæsarean section very rarely arose. Munro Kerr, of Glasgow, had found both bipolar version and the bag give good results, differing but little. He thought that in cases fulfilling Norris's condition (see above), Cæsarean section had a place.

The general practice in England follows much the same lines, i.e., bipolar version and Champetier's bag are the ordinary methods of treatment in use, the latter being undoubtedly superior. There can, however, be no doubt that in central cases diagnosed early, before either great hæmorrhage has occurred or the cervix has dilated much, the best treatment would be Cæsarean section, provided the means of performing it efficiently are at the disposal of the obstetrician. Where, however, the patient is already collapsed from loss of blood, the bag or bipolar version should be preferred, because their application does not necessitate immediate evacuation of the uterus, a proceeding which always produces severe additional shock in a patient whose state is already precarious, and frequently precipitates the fatal end.

See also **Ergot** (*page* 15) ; **Gossypii Cortex** (*page* 17) ; **Pituitary Extract** (*page* 34).

References.—[1]*Lancet*, 1911, Ap. 15, and *Brit. Jour. Obst. and Gyn.* 1911, Jan.; [2]*Brit. Med. Jour.* 1911, Mar. 4, and Mar. 11; [3]*Pract.* 1911, Feb.; [4]*Brit. Jour. Obst. and Gyn.* 1911, June; [5]*Jour. Amer. Med. Assoc.* 1910, Nov. 19; [6]*Brit. Med. Jour.* 1909, Oct. 22; [7]*Ibid.*; [8]*Trans. Amer. Gyn. Soc.* 1911, July.

LACRYMAL APPARATUS, DISEASES OF.

A. Hugh Thompson, M.D.

Mucocele.—Priestley Smith[1] pleads for a more conservative method of treatment (*see Medical Annual*, 1908, 353). Periodic probing, he says, was banished from his practice many years ago, after short trial, as being too painful and troublesome, and often unsuccessful. On the other hand, the continuous wearing of a **Lacrymal Style** for a longer or shorter period is in many cases sufficient to produce a cure. The chief objection to this method is the unsightly appearance of the end of the style projecting over the skin in patients so treated. It only needs a little extra time and care on the part of the operator, however, to prevent the style from being noticeable. A style to be worn for any length of time ought to be of silver, which never breaks. It is not so easily bent as lead, so that the best plan is to introduce a lead style first and, having bent it to the required shape, to use it as a model for the silver one. "The lower canaliculus is slit with the canaliculus knife in such fashion that the gutter shall look backwards rather than upwards when the lid resumes its normal position." To

prevent pain on the first introduction, the duct should be gently syringed with 2 per cent cocaine solution, using for this purpose a hollow probe and syringe combined. "The crook should occupy the whole length of the canaliculus and lie hidden in it. It must not tend to turn backwards towards the eye. It must not touch the cornea when the eye turns towards the nose. It must be withdrawn and altered a time or two, if necessary, until it fits properly."

Extirpation of the Lacrymal Sac.—The most common difficulty in this operation, and one which at times renders it impossible to perform satisfactorily, is hæmorrhage. The following is the method adopted by Harrison Butler,[2] founded upon Josef Meller's operation. Codrenine is injected to secure local anæsthesia and anæmia. The primary incision is through skin only, in the form of a half circle with the centre at the inner canthus. When the flap is dissected up, the palpebral ligament is defined—not cut through as in the ordinary operation, but drawn out of the way by means of a thread held by an assistant The deep fascia is then cut through vertically and the sac exposed, the rest of the operation being carried out in the ordinary way.

References.—[1]*Ophth. Rev.* 1911, 257; [3]*Ophthalmoscope*, 1911, 624, and *Brit. Med. Jour.* 1911, ii, 1171.

LARYNGISMUS STRIDULUS.

(*Vol.* 1909, *p.* 7)—Eustace Smith finds **Antimonial Wine**, in frequent doses of 15 to 20 minims, an excellent remedy. In severe cases it should be pushed till it causes vomiting.

LARYNX, DISEASES OF. *George L. Richards, M.D., Fall River.*

Tuberculosis.—Minor's[1] drawings (*Fig.* 99) show very well the *early changes.*

Hunt[2] reports a case in a *child of seventeen months* in which diagnosis was confirmed by autopsy. Tuberculous disease of children is considered rare under ten, but this is doubtless due to the unsatisfactory nature of examination previous to the introduction of Killian's direct method. Further, the early changes, slight swellings and œdema about the arytenoids, disappear after death.

Wilkinson,[3] after several years' use of **Tuberculin,** finds it in his experience the best remedy for the laryngeal lesions. He uses it, without any local measures, in all stages of the disease, even on the so-called hopeless cases, and in large doses. His results are hardly in accord with other workers in the same field, who find tuberculin useful but by no means a specific. It is only an adjunct to other methods,

Roth[4] reports a number of cases of *painful swallowing* in laryngeal tuberculosis treated by subcutaneous **Injection of Alcohol** as nearly as possible into the sheath of the superior laryngeal nerve. From one to two grams of 85 per cent alcohol, warmed a little above body temperature, are injected at the point where the internal branch of the superior laryngeal nerve penetrates the thyrohyoid membrane, a point about halfway between the upper border of the thyroid cartilage and the hyoid bone, and about 1 cm. in front of the superior horn of

the thyroid cartilage. The needle is inserted to a depth of 1 to 1·5 cm. perpendicularly to the surface. Anæsthesia lasts for about seven days, and after several injections its duration is somewhat lengthened. It can be used even up to the latest stage of the disease, the progress of which is in no way influenced.

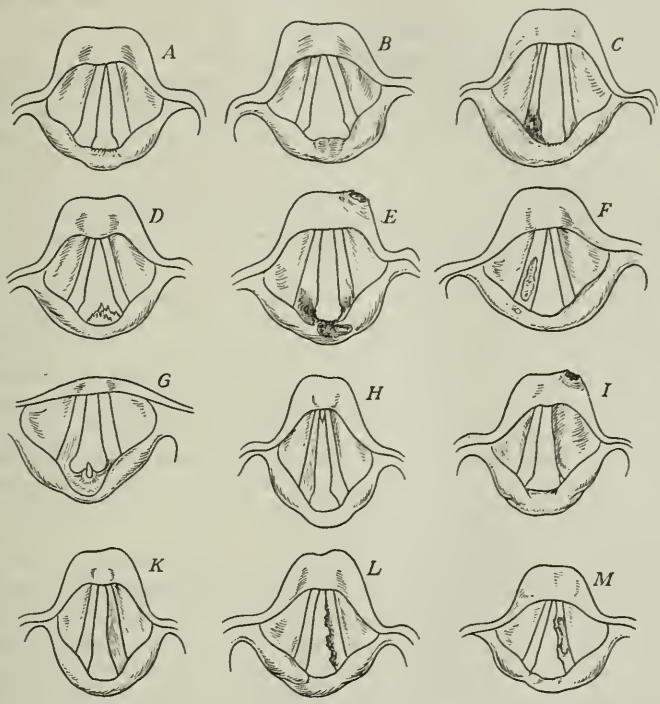


Fig. 99.—Early Manifestations of Laryngeal Tuberculosis.

A.—Grey wrinkling of posterior commissure, not diagnostic, but suspicious if tuberculosis exists in the lungs. Found in many cases of chronic laryngitis.

B.—Typical table-like elevation in posterior commissure, with central longitudinal groove. Mucuos membrane over it usually unduly red, at times œdematous and yellowish (*tafelförmige Erhebung* of Schroetter).

C.—Swelling of right arytenoid region and reddening of posterior insertion of right and left cords, this last very typical, often with small white ulcer at processus vocalis. Right false cord slightly redundant.

D.—Granulations arising from, and hiding ulcer in posterior commissure.

E.—Superficial dirty ulcer of posterior commissure invading upper surface, thereby causing severe dysphagia. Thickening and ulceration of epiglottis. Thickening and redness of posterior ends of cords which are invaded by ulcer of posterior commissure.

F.—Superficial ulcer of upper surface of right cord.

G.—Hornlike growth in posterior commissure with reddening of posterior half of right cord.

H.—Small growth protruding between cords in anterior commissure. Right cord irregularly thickened and reddened.

I.—Great thickening of left false cord which overlaps and hides true cord. Arytenoids and posterior commissure somewhat thickened. Swelling and early ulcer on epiglottis.

K.—Spindle-shaped thickening with reddening of left cord. Reddening of petiolus of epiglottis.

L.—Small ulcers on free border of left cord, giving characteristic nibbled-out appearance.

M.—Spindle-shaped thickening and ulceration of left cord.

Papilloma.—Broca and Roland[5] state that there is no treatment for papilloma of the larynx which will give absolute destruction of the growth without recurrence, and without impairment of the voice.

In infants with extreme dyspnœa, **Tracheotomy** is preferable. **Extraction by Continued Treatment** is the procedure of choice, and unless contraindicated, should always be tried. Where this is impossible because of age, location, or rapid increase of the growth, **Thyrotomy** is indicated. Where, as the result of other treatment, there is a constriction of the larynx, **Laryngostomy** is indicated.

Calone,[6] of Bordeaux, first used **Calcinated Magnesia** in the treatment of papilloma of the larynx in children ; he reports two cases in which there were numerous papillomata, each responding quickly to treatment (after four months and one year respectively). Sargnon, of Lyons, reports the history of an infant with the whole length of the trachea involved. In addition to the internal administration, he used the magnesia as an insufflation with satisfactory results. The daily dose for a child five years old is 50 cgrams.

Singers' Nodules.—Koenig[7] uses the galvano-cautery, which is preferred to cutting methods, as the blood-vessels and lymphatics are thus obliterated, and the cord is protected against any intercurrent or subsequent infection. The cautery point used is of platinum, protected by a small flat copper sheath, from which protrudes the cauterizing part, a small ball of platinum. It is very bright and easy to see when the reflected light falls upon it. The copper background renders it still more visible. The cauterization by this means can be absolutely localized and controlled. It is followed by a slight reactive redness of the cord, which disappears in a few days.

Aphonia.—Johnson[8] has had good results in the treatment of certain forms of aphonia with mild currents of **Faradic Electricity** where the trouble seemed to be due to impaired nervous tone and muscular balance. He recommends its use, especially in those cases in which, after the mucous engorgement has disappeared, damage to the neuro-muscular apparatus remains. The secret of success is in the regular and persistent use of mild currents which are not calculated to produce violent contractions of opposing healthy muscles. Carefully applied for a prolonged period, this form of electricity exercises a selective action on the affected structures, and eventually restores their tone.

References.—[1]*Jour. Amer. Med. Assoc.* 1910, Nov. 19 ; [2]*Liverp. Med.-Chir. Jour.* 1911, Jan. ; [3]*Brit. Med. Jour.* 1910, Nov. 26 ; [4]*Münch. med. Woch* 1910, Oct. 18 ; [5]*Rev. de Chir.* 1911, Mar. 10 ; [6]*Sem. Méd.* 1910, Nov. 23 ; [7]*N.Y. Med. Jour.* 1911, Feb. 11 ; [8]*Lancet*, 1910, Nov. 5.

LEISHMANIASIS.

Leonard Rogers, M.D., F.R.C.P.

Kala-azar.—F. Durante[1] records a case in Rome, which was verified by finding the parasites in blood obtained from the spleen by puncture. Cancrum oris occurred and death ensued, but no post mortem could be obtained. A. Cretien[2] records a case of kala-azar in Malta, confirmed by spleen puncture, in which the Leishman-Donovan bodies were found in mucous flakes in the stools. The same writer[3] records a

number of cases of infantile kala-azar in Malta similar to that found in Tunis by C. Nicolle. He has demonstrated the presence of Leishman-Donovan bodies in many of them, while the course is very similar to that of true kala-azar. He also confirms Nicolle's statement that similar parasites are frequently found in dogs post mortem, in which respect the African infantile form appears to differ from that of the disease in India. He shows by figures that infantile kala-azar is a serious cause of mortality in children under five years in Malta. Professor Galle[4] reports to Sir Ronald Ross that he has found the Leishman-Donovan body in a case of "ponos," from a patient in an island off the coast of Greece, others having previously suspected the identity of the diseases.

Treatment.—E. Muir[5] records favourable experiences with hypodermic injections of **Quinine Sulphate.** From two to six grains in acid solution are injected intramuscularly after previously inserting 5 min. of a 2 per cent solution of cocaine through the same needle, to prevent subsequent pain. A marked increase of the polymorphonuclear leucocytes and reduction in the size of the spleen follow the injections, which are repeated as soon as the effusion produced by the first has subsided. In Kalna (in the Burdwan district) the disease is extremely common, and if cases are seen within the first six months, and this treatment is persisted with, it seldom fails. He has also tried in several hundred cases injections of **Turpentine** to produce an increase of the leucocytes, but found quinine less painful and more effective. He has seen recovery from kala-azar follow cancrum oris, as reported previously by others, such septic processes increasing the leucocytes and checking the disease. A. Christomanos[6] records cases of kala-azar in Greece, and found the parasite in the spleen blood. He has used large doses of **Atoxyl** and **Arsenic** with only apparent improvement. In one case **Salvarsan** was injected, but forty-eight hours later unchanged parasites were found in the spleen.

Oriental Sore.—C. M. Wenyon[7] reports the results of six months' work at Bagdad. Nearly all the inhabitants suffer from the disease, chiefly during childhood, one attack protecting for life as a rule. It most frequently appears in the autumn when the dates are ripening, and so is known locally as "date boil." It almost always affects exposed parts of the body, especially the face, leaving marked scars known as "date scars." The lesions are usually single. The incubation period is uncertain, but may be long. The disease presents two clinical types; one with ulceration, often very foul from secondary bacterial contamination, and the other as a raised boil-like prominence, but with an unbroken skin, from which pure cultures of the parasite have been obtained by puncture. The duration of the disease is about one year, and no treatment appears to be of any avail, although some antiseptic ointment, such as yellow mercury, is useful in keeping the sores clean. There are no marked constitutional symptoms. Various animals, including 80 dogs, have been examined for the parasites, with negative results, nor could any of them be inoculated with the

disease, which greatly limited the opportunities for research. Certain insects have been fed and dissected. In the house-fly and in bed-bugs slight development has occasionally been found, such as Patton discovered in bed-bugs in connection with kala-azar, but not sufficient to constitute them true carriers of the disease. It is possible that house-flies might carry the disease mechanically to uninfected open sores. Stegomyia mosquitoes are very prevalent in the Bagdad boil season and readily feed on human beings, while in four instances herpetomonads have been found in their mid-gut after feeding on the disease, which may have been developments of the parasite; so this insect appears to be the most likely carrier. R. M. Carter[8] records further descriptions of the development of the parasites of oriental sore in artificial cultures, and a comparison of the forms seen with those of a very similar parasite commonly met with in the alimentary canal of the insect *Erthesina fullo*. S. T. Darling[9] describes a case of oriental sore with the typical parasites in a patient who had become infected in Panama. The ulcer appeared on the ear, previous to which he had been bitten by a fly in the bush.

H. H. Broome[10] cured an oriental sore on his hand with a single application of **CO_2 Snow,** after the failure of nine applications of *x*-rays. This has also given good results in other cases, but requires further study.

A. R. Ferguson and Owen Richards[11] record ten cases of *granuloma allied to oriental sore*, which they met with in Egypt, producing single or multiple lesions in the male fellaheen, during their adult working life, usually on the arms or legs. In most of them Leishman-Donovan bodies were found, being least numerous in the cases which showed secondary bacterial infection. In such they may indeed be entirely absent. They usually present prominent warty growths, but may be only smooth flat slightly raised patches. They run a chronic course without constitutional disturbance, and are best treated by **Excision** and **Skin Grafting.** Microscopically they show mononuclear infiltration of the subcutaneous tissues, together with the parasites in variable numbers. They differ from epithelioma in being superficial and not affecting the deeper tissues.

REFERENCES.—[1]*Gaz. deg. Osped.* 1911, Mar. 19; [2]*Brit. Med. Jour.* 1911, Jan. 28; [3]*Ann. Trop. Med.* 1911, 15; [4]*Jour. Trop. Med. and Hyg.* 1911, Jan. 2; [5]*Ind. Med. Gaz.* 1911, 58; [6]*Deut. med. Woch.* 1911, 641; [7]*Jour. Trop. Med. and Hyg.* 1911, Ap. 1; [8]*Ann. Trop. Med.* 1911, 37; [9]*Jour. Amer. Med. Assoc.* 1911, i, 1257; [10]*Ind. Med. Gaz.* 1911, Apr.; [11]*Ann. Trop. Med.* 1910, July.

LEPROSY. *Leonard Rogers, M.D., F.R.C.P.*

T. L. Sandes[1] has been investigating *modes of infection* of leprosy at the Robben Island Asylum, South Africa, and has discovered that the typical acid fast bacilli can be found in bed-bugs fed on leprosy patients, but not in control ones. In other biting insects they were only rarely seen, but about 30 per cent of the fed bed-bugs showed them, occasionally in very large numbers, indicating multiplication

within the insects, and up to sixteen days after being fed. In the absence of any susceptible animals it has not been found possible to produce infection through this means. E. C. Long,[2] working independently in Basutoland, has come to a similar conclusion, and states that acid fast bacilli can be found in nearly every bed-bug which freely bit over leprous tissue.

Charles W. Duval[3] reports further work on cultivation of the leprosy bacillus which was obtained by Clegg in 1909 and confirmed by Duval the following year. The initial cultures are difficult to obtain, but after a time they grow readily on any alkaline medium of human or rabbit blood agar and glycerinated serum agars. The organism has been grown from the nasal discharges in two out of five cases, as well as from cutaneous nodules in eight cases. The organisms tend to become like a diplobacillus in older cultures, but return again to beaded rods after animal passage. Cultures retain their acid-fast characters. Animal experiments prove that infection may take place from one individual to another without the aid of any intermediate host, such as an insect. This, taken with the long life of cultures, indicates the need of strict segregation of the more infectious type of case. White and Japanese dancing mice may be infected both by subcutaneous inoculation and through the wounded nares. Monkeys have also been infected. Experiments point to the possibility of human infection through the skin without obvious surface lesions. Cultures may survive over a year at temperatures of 32° or 37° C. and they survive 70° C. for 30 minutes and 65° C. for one hour. The optimum temperature is about 32° C. The high resistant power appears to be due to the fatty envelope, while they also contain clear spaces, which may possibly be spores. The prophylaxis of the disease has also been studied. The opsonic content of the blood varies in different stages. Complement is present in normal amounts, while specific amboceptors are present in considerable quantities, the reactions being specific. The most active constituent of the leprosy bacillus in producing antibodies is a lipoid substance, but the presence of other toxic bodies prevents the use of large doses of the lipoids.

Further work is proceeding on these lines.

E. R. Rost and T. S. Beauchamp Williams recently published in a Scientific Memoir of Indian Army Medical Officers, a preliminary report on the cultivation of the leprosy bacillus, and the last named also records further details of the work,[4] with coloured plates, and temperature charts illustrating the reactions after the use of a leprolin prepared from their cultures. Williams reports that he has cultivated from a number of cases of leprosy a very pleomorphic streptothrix, which in varying circumstances may present either non-acid-fast long filaments or short rods, or acid-fast filaments or bacillus-like fragments of a streptothrix. An originally acid-fast growth may lose this character, while the non-acid-fast organism may be reconverted into an acid-fast one by symbiosis with amœba, as in Clegg's original

cultures with that protozoon. By continuing to subculture in Rost's medium the diphtheroid bacillus may become an acid-fast streptothrix similar to those obtained by Rost and Deycke, which produces in guinea-pigs lesions somewhat resembling those of leprosy. Injection of the cultures produces in leper patients general and local reactions which appear to be specific, as only negative results are obtained by its use on healthy persons. Williams has treated fifteen cases with his **Leprolin,** with the result that further progress of the lesions is prevented, while marked improvement is obtained in some. Too much must not be expected from such treatment in old-standing cases, but in the early stage he thinks the disease may be cured. Rost[5] records notes of twelve cases of leprosy treated by a **Vaccine** prepared from his cultures of the leprosy streptothrix, of whom five were practically cured and the remaining seven all remarkably improved. He thinks 1 c.c. doses of a sterilized six weeks' broth culture give the best results when injected weekly so as to get slight reactions in nodular cases and higher ones in the anæsthetic form.

S. Pollitzer[6] publishes a historical sketch of leprosy in America, pointing out that the disease is now widespread in the United States, several hundred cases having been reported. Isadore Dyer[7] deals with the sociological aspect of the problem, and points out that leprosy may spread, especially in the southern states, and advocates segregation of cases to lessen this danger. Isadore Dyer and Ralph Hopkins[8] write on the diagnosis of leprosy, and describe the earlier skin lesions which should cause the disease to be recognized, and enable the frequency of its importation into the United States to be checked. Castorina[9] draws attention to the frequency of leprosy in Sicily and advocates more active measures in dealing with the disease.

Otto Peiper[10] records a third report on the **Nastin** treatment of leprosy. Of five cases, two were cured and remained well for a considerable time ; one ran away, and two were admitted to a leper asylum uncured, the treatment being discontinued for want of nastin. Cures take a very long time to obtain, native patients rarely continuing long enough for permanent results. K. S. Wise[11] has published a report on the **Nastin** treatment of leprosy at the British Guiana Asylum, which is of especial importance, as the discoverer of the method, Professor Deycke, personally superintended the treatment for six months, while the trial extended over one year and nine months. No less than 135 unselected cases were treated, all who volunteered being accepted. Only 3·7 per cent were known to be of less than two years' duration. A few early cases improved so considerably that they might be regarded as approximately cured, but other early cases got much worse. The majority of the cases remained in *statu quo*. Wise thinks that the favourable results were so few that wider experience can alone show if the successful cases were instances of natural improvement, or were really due to the nastin. N. Maldaresco[12] reports favourable results in three cases of leprosy by the use of **Guaiacol**

locally as an ointment, with 3-gr. doses added to 1 gr. of eucalyptol, twice daily by the mouth.

For the use of **Salvarsan** in, *see page* 54.

REFERENCES.—[1]*Brit. Med. Jour.* 1911, ii, 469; [2]*S. Afr. Med. Jour.* 1911, 178; [3]*Jour. of Cutan. Dis.* 1911, 274; [4]*Ind. Med. Gaz.* 1911, May; [5]*Ibid.* 1911, 219; [6]*Jour. of Cutan. Dis.* 1911, 265; [7]*Ibid.* 1911, 274; [8]*Jour. Amer. Med. Assoc.* 1910, ii, 909; [9]*Gaz. deg. Osped.* 1911, Feb. 23; [10]*Therapist*, 1911, Jan. 14; [11]*Lancet*, 1911, ii, 237; [12]*Sem. Méd.* 1911, Jan. 18.

LICHEN PLANUS. *E. Graham Little, M.D., F.R.C.P.*

Bullæ are so rare a development in lichen planus that cases showing this addition deserve record. Muller[1] saw such a case, the diagnosis of which was confirmed by Ravogli. Typical lichen planus papules were present, as well as vesicles and bullæ, with opaque contents, sometimes showing hæmorrhage. No arsenic had been given prior to this appearance.

The TREATMENT adopted was that of injection of 20 min. of 10 per cent solution of **Cacodylic Acid** into the muscles below the scapula every two or three days, and a local application of **Zinc Ointment** with carbolic acid and bichloride of mercury; the eruption disappeared and the patient put on weight under these methods.

REFERENCE.—[1]*Jour. Cutan. Dis.* 1911, 331.

LICHEN SIMPLEX CHRONICUS. *E. Graham Little, M.D., F.R.C.P.*

Haase[1] reports a case, with careful histological investigation, of a papular eruption of the pubes, axilla, and breast, accompanied by the loss of hair in the two former positions. The eruption occurred in an anæmic and neurotic girl, and had persisted for four years. It was intensely itchy, and at last occasioned her detention in a home, as self-control was lost. Sections showed a remarkable dilatation of the sweat coils and degeneration of the lining cells.

TREATMENT was very unsatisfactory; most relief was obtained from compresses of **Hot Salt Solution** to the diseased areas; *x*-ray treatment was refused.

REFERENCE.—[1]*Jour. Amer. Med. Assoc.* 1911, Jan. 21.

LUNG, COLLAPSE OF. (*See* ABDOMINAL SECTION.)

LUPUS VULGARIS. *E. Graham Little, M.D., F.R.C.P.*

The use of **Old Tuberculin** applied in an ointment to local lesions of tuberculosis was suggested by Moro, of Munich, and has been used by Verge[1] under Norman Walker with considerable success. A 5 per cent solution of old tuberculin made up with vaseline was used, and well rubbed into the skin for one to two minutes. Lint spread with the same ointment is then applied and kept in position with bandages for twenty-four hours. The surface is cleansed, and the application renewed daily for three to four days. The treatment is then suspended, soothing applications are used, and healing of the excoriations results in about ten days. The course may then be renewed. In order to

prevent accidental contact of the tuberculin ointment with healthy parts, these are protected by anointing them previously with the following :—

R	Hydrarg. Ammon.	gr. v.	Vasilini	℥j
	Zinci Oxidi	℥j		

Sutton[2] records an interesting case of lupus vulgaris which developed curiously, the disease healing in the centre and spreading peripherally until a circinate lesion was formed, 5 by 8 cm. in area. Histological examination showed lupoid structure and tubercle bacilli. The entire area was excised with good results.

References.—[1]*Brit. Med. Jour.* 1910, ii, 2023 ; [2]*Jour. Cut. Dis.* 1910, 391.

LYMPHADENITIS, TUBERCULOUS.

(*Vol.* 1910, *p.* 34)—Rachford recommends **Guaiacol** administered by inunction.

LYMPHADENOMA. *Robert Hutchison, M.D., F.R.C.P.*

Pathology.—Stuart McDonald[1] states that there is now a general consensus of opinion that lymphadenoma is a disease *sui generis*, with a characteristic morbid histology, and that it is in no way related to tuberculosis, although lymphadenomatous glands often become secondarily infected by tubercle bacilli. The disease is probably inflammatory rather than neoplastic. Like other observers, he has failed to find any causal organism in the cases he has investigated, but quotes a paper by Fraenkel and Much,[2] in which they state that by special staining methods they have demonstrated in lymphadenomatous glands granular bacilli morphologically identical with the granular form of tubercle bacilli, but not "acid fast." These authors were unable to cultivate the bacilli, which are apparently not pathogenic to guinea-pigs.

Symptoms.—Rolleston[3] adheres to Dreschfeld's division of the clinical forms of lymphadenoma into three main groups : (1) When the superficial glands are mainly enlarged ; (2) When the symptoms are mainly due to the presence of intrathoracic lymphadenoma ; (3) When the symptoms are mainly abdominal. The thoracic or abdominal symptoms not uncommonly supervene in cases which begin in the ordinary way. The disease is usually local for a varying time, and then becomes widespread ; the general course is therefore chronic, but acute cases occur. It is usually stated that the whole course of the disease occupies two or three years ; but the interval between its local appearance and its generalization varies. Havilland Hall[4] draws attention once more to the not infrequent occurrence of intermittent pyrexia in lymphadenoma, and describes examples.

Diagnosis.—Eve[5] states that the chief distinction between lymphadenomatous and tuberculous enlargements is the great mobility of the glands in the former. If some of the glands are attached to each other or to surrounding structures, and especially if softening can be detected, the disease is probably tubercle. Nevertheless, in some acute cases of Hodgkin's disease and a few subacute cases, the glands become conglo-

merate, and surrounding parts infiltrated ; softening may also occur from a change resembling coagulation necrosis. In the early stage, before distant glands and the spleen have become affected, such cases can only be distinguished from tuberculous and primary malignant enlargements (lymphosarcoma) by excision of a gland and microscopic examination.

Owing to the frequency with which lymphadenoma and tuberculosis are associated, none of the tuberculin reactions is of any value in the diagnosis between the two conditions.

TREATMENT.—Eve asserts that the *operative* treatment of lymphadenoma may be summed up briefly to this effect, "Let it alone," for recurrence always takes place. **Arsenic** remains the only medicinal treatment of value, although salvarsan is still on trial (*see page* 54). **X-Rays** may produce a rapid diminution in the size of the glands, but the result is not permanent.

[Dr. Percy Wilde gives **Silicate of Soda,** diluted with five parts of distilled water in 10-drop doses thrice daily, and states that this has a specific action. If too rapid resolution takes place, the remedy must be given at longer intervals.—ED. *M.A.*]

REFERENCES.—[1]*North Eng. Clin. Jour.* 1911, Jan. ; [2]*Zeits. f. Hygiene*, 1910, 67, 159 ; [3]*Pract.* 1911, Ap. ; [4]*Ibid* ; [5]*Ibid.*

MALARIA. *Leonard Rogers, M.D., F.R.C.P.*

S. T. Darling[1] deals with the factors in the *transmission and prevention* of malaria in the Panama Canal zone. After describing the anophelines in the region, and the methods of infecting mosquitoes, he discusses the limits of infectiousness of man and the effect of various preventative measures. *Ce. albinana*, with which he worked, was not readily infected by a single feed of the blood of a malarious patient unless about 1 gamete per 500 leucocytes, or 12 per c.mm. were present. Experiments on the effect of quinine on the gametes show that these resistant forms steadily decrease under the influence of 10 gr. three times a day, and disappear in from two to six weeks, during which the large mononuclear leucocytes increase.

R. Ross and D. Thomson[2] record some *enumerative studies* of malaria in which the parasites in a c.mm. of blood were counted at frequent intervals by Ross's thick film process. They found a decided correlation between the number of asexual parasites in the peripheral blood and the fever, although the latter only occurs when the parasites exceed some hundreds per c.mm., while they continue to exist in the circulating blood in small numbers during the afebrile periods, and often increase again for several days before a recurrence of the pyrexia. Full doses of quinine, when continued, reduced the asexual parasites by 50 to 80 per cent. They also believe that the sexual forms require eight to ten days for their development, and that the long persistence of crescents is due to their constant replenishment from the asexual stage. D. Thomson,[3] in a further paper, confirms the last statement,

and concludes that individual crescents do not live more than a few days in the peripheral blood. Quinine has no direct action on the crescents, but the continual use of the drug greatly reduces them in three weeks, if given in daily doses of twenty to thirty grains, by destroying the asexual source of supply. Twelve grains of methylene blue daily also reduces the crescents. The same writer goes on to deal with the leucocyte changes in malaria, confirming and extending the mononuclear increase described by Stephens and Christophers. He noted in apparently cured cases of malaria, a daily variation in the leucocyte curve, showing that at the time of the day at which the rigor and fever formerly occurred the mononuclear percentage is lowest; and there also occurs a marked leucocytosis of only a few hours' duration, which may often reach as high as 30,000 to 50,000 per c.mm. As this remarkable change was always found in forty cases examined, he considers it to be an infallible sign of previous malaria. (*See also* BLOOD, EXAMINATION OF.) R. Ross, D. Thomson, and G. C. E. Simpson[4] also record a very instructive case of blackwater fever, studied both before and during the malarial paroxysm by their enumerative methods. The parasites disappeared with the onset of the hæmoglobinuria, and did not return in spite of a second later pyrexia without urinary changes. Both these febrile attacks were accompanied by repeated rigors, and were quite unlike an ordinary attack of malaria, so they conclude that the active agent in producing this complication is not the malarial toxin, although blackwater fever is a complication of that disease.

Gioseffi[5] has studied the *incubation period* of malaria on the Austrian-Lloyd boats from Bombay to Trieste, by noting the days after exposure to infection in Bombay before fever developed on the voyage home. He concludes that in benign tertians it varies between 10 and 22 days, with a mean of 16 days; and in malignant tertians between 8·7 and 17·5 days, with a mean of 13 days. [The last figures in particular are much higher than those given by authorities on the subject, and point to the possibility of infected mosquitoes being on board the boats.—L. R.]

Ciro L. Urriola[6] describes the presence of malarial *pigment in the urine* as a constant and pathognomonic sign of malaria, often present when no parasites can be found in the circulating blood. The centrifuged deposit is examined with the microscope, and if no pigment is found after half an hour's search, malaria can be safely excluded.

H. de Brun[7] records at length forty cases of *infantilism* associated with repeated attacks of malaria during childhood, in a highly malarious tract in Beyrouth. They mostly presented evidence of enlargement of the spleen and of anæmia. The district for a long time has not been able to supply the legal number of recruits for the army. The series of cases is especially noteworthy for diminutive height and for the undeveloped state of the genital organs, accompanied by absence of all signs of virility. Many of them were very backward in mental development, yet a few showed keen intellects. He thinks that

chronic malaria produces an arrest of development, and suggests that this results from a fibrous atrophic change in the thyroid gland, which was found post mortem in a few cases. Possibly the suprarenals may also be similarly affected to some extent.

PROPHYLAXIS.—G. Duncan Whyte[8] has made eighty analyses of *the air inside and outside a mosquito net.* Five litres of air were examined for the percentage of carbon dioxide, but when taken at the same time no difference was found. On the other hand, estimations were made, by the Forchammer process, of the amount of organic matter, and fifty such analyses agreed in showing about twice as much organic matter within the net in the morning. The amounts were such that water containing them would be condemned for drinking purposes. He therefore thinks that in certain conditions, such as in tuberculosis, a mosquito net should be dispensed with, and oil of citronella relied on to keep off the pests.

Hugh W. Acton[9] discusses the rationale in the application of **Quinine** prophylaxis, and points out the great differences of opinion regarding the dosage necessary for this purpose, which he thinks is due to differences in the type of fever met with by different observers. Thus, the benign tertian is much more amenable to quinine than the malignant tertian form. Moreover, the mean incubation period given by different writers is 14 days for quartan, 11 days for benign tertian, and only 3 to 6 days for malignant tertian. Allowing at least forty-eight hours before the fever develops, prophylactic quinine should be given at intervals of not less than eight days in the case of benign tertians, but at not more than four days during the prevalence of the malignant tertians, while during severe infections of the latter type due to unusual prevalence, the interval should be shortened to two days. As tertian infections are commonly double ones, it is safer to give the quinine on two consecutive days in 5- to 10-gr. doses at intervals of six to eight days for benign tertians, and in doses of 10 to 15 gr. at intervals of four, or occasionally two, days for malignant tertians.

Edward H. Phillips[10] deals with an interesting *epidemic of malaria* in a previously little affected portion of the Orange River Valley, which occurred in 1909 in a sparsely populated tract mainly inhabited by very poor coloured races, two-thirds of whom occupy riparian villages. In 1908 the rainfall was 1·99 inches, but in 1909 it reached the extraordinary total of 12 inches, leading to extensive flooding of the Orange River, which rose twenty feet. This caused the swarming of mosquitoes, together with impoverishment of the people. Epidemic malaria is reported to have followed a similar flood in 1881, and a slighter one in 1900, since which there had been but little malaria for nine years. In the early part of the recent outbreak, mild benign tertians predominated, but later severe malignant tertians occurred, and were much less amenable to quinine treatment. When at its height, quite 75 per cent of the population were attacked by malaria, and whole families of coloured people were wiped out, work in places being at a standstill. The death-rate of the district rose from

205 to 458, of the latter 287 being returned as malaria, which he considers not far from the truth. The prevalent anopheles was the *Pyretophorus costalis*, which he thinks may have been brought down from the upper reaches of the river by the floods, or possibly by wind. During the epidemic, mosquito reduction on a large scale was quite impracticable, while he does not think such measures will be feasible in the future owing to the length of the river margin and the scanty population. **Quinine Prophylaxis** on a large scale was adopted, and proved most successful. Mixtures and tablets were distributed gratis from house to house, over 800 ounces of quinine and 30,000 tablets being employed among a population of 8,811. He also got good results from hypodermic injections of quinine with strict asepsis. [The moral of this and the 1908 Punjab epidemic is, that local studies of the relation of rainfall to malaria should enable such outbreaks to be anticipated before they have become serious, and a frightful mortality averted by organization of timely and extensive quinine prophylaxis and treatment.—L. R.]

W. Byam[11] reports a careful study of *malaria among native troops* at Kassala, in Egypt, along the usual lines. Much was done to lessen mosquito prevalence, but these pests were still very numerous at the time most of the malarial cases were admitted. Bed-bugs infested the mosquito nets, and could only be destroyed by frequently boiling the nets. Quinine prophylaxis was largely used in the form of bi-weekly 10-gr. doses, and lectures were given. The malaria was less than in former years. One case treated at first as malaria proved to be liver abscess. (Blood examination not given.) Nearly all the cases were benign tertians, and there was only one death.

David Bruce[12] reports on the present condition of Ismailia, where the measures adopted for stamping out malaria have been successful.

C. F. Gubbin[13] describes anti-malaria measures at Colaba, Bombay, on the usual lines. The marshy foreshore bred innumerable anopheles and required special drainage measures to alleviate this. Mosquito prevalence was so much reduced by drainage that mosquito curtains have become scarcely necessary. The arrival of an infected regiment from Mian Mir caused an increase of the malaria in the station on account of relapses, so the effects of the above measures cannot yet be estimated.

A. B. Smallman[14] discusses the prevention of malaria among British troops in India, and doubts if there has been any real reduction in malaria among them during the thirteen years following Ross' discoveries. He attributes this want of success to the fact that the conditions obtaining in the usual Indian cantonment are very different from those of the places from which successful anti-malaria measures have been reported. He thinks that in India the most valuable preventive measures are the use of mosquito nets and prophylactic doses of quinine, too much attention having hitherto been devoted to the mosquito and too little to the man. In Quetta he tried continuing quinine after an attack of malaria, in 10-gr. doses daily

for a week, and then three times a week up to four months; in 275 cases he had only 4 per cent of relapses after excluding reinfections, which is a great improvement on the usual results obtained in the army in India. A 30 per cent reduction in the amount of malaria was obtained. Malarial carriers were also eliminated.

TREATMENT.—H. B. Ulmer[15] records a case of double benign tertian malaria treated with **Quinine and Urea Hydrochloride** in 1-gram doses hypodermically. The fever stopped two days after the second injection, but recurred twelve days later, and the treatment had to be repeated. The treatment should be continued twice a day for two weeks, then twice a week for three months. This salt is readily soluble. A. C. MacGilchrist[16] records the results of some experiments on the solubility and absorbability of **Quinine Salts.** He finds that even the quinine salts which are most soluble in water in the dilutions usually used for injections, form in a few minutes a solid gelatinous mass when mixed with ox blood-serum. When injected subcutaneously it is precipitated and only slowly absorbed, a more rapid effect being obtained by oral administration, especially on an empty stomach. Intravenously dilutions to at least 1 in 150, but preferably much greater, should be used in cases of pernicious malaria with cerebral symptoms. Rectal administration is very irritating and of little value.

Bruce, Skinner and H. W. Carson[17] report on the influence of **X-rays** applied over the spleen, with a view to destroy the malarial parasites or render the blood able in some way to kill them. Three to five minutes' exposures were given, and cases of apparent good effect are recorded, which, although not decisive, they think make a further trial worth while. H. D. McCulloch[18] has treated three cases of malaria with enlargement of the spleen and liver with *x*-rays with gratifying results.

H. W. Pierpoint and H. W. Acton[19] deal with the use of **Arylarsonates** in the treatment of malarial cachexia. He has never seen a case of true malarial cirrhosis of the liver. Acute hyperæmia of the spleen is most effectively reduced by quinine, but in chronic enlargement **Soamin** in 5-gr. doses was given intramuscularly on alternate days for five doses, and then omitted for ten days before repeating the course, with good results.

For suggestions as to the value of **Salvarsan,** *see page* 55.

REFERENCES.—[1]*Ann. Trop. Med.* iv, 179; [2]*Ibid.* 267; [3]*Ibid.* v, 57; [4]*Ibid.* i, 307; [5]*Gaz. deg. Osped.* 1911, Jan. 19; [6]*Sem. Méd.* 1911, Jan. 4; [7]*Rev. de Med.* 1910, 800; [8]*Brit. Med. Jour.* 1910, Oct. 1; [9]*Ind. Med. Gaz.* 1910, 283; [10]*S. Afr. Med. Jour.* 1911, 2; [11]*Jour. R.A.M.C.* 1911, 269; [12]*Ibid.* 402; [13]*Ibid.* 491; [14]*Ibid.* 477; [15]*N.Y. Med. Jour.* 1910, Oct. 1; [16]*Sci. Mem. Gov. Ind.* 1911, No. 4; [17]*Brit. Med. Jour.* 1911, Feb. 25; [18]*Jour. Trop. Med. and Hyg.* 1911, May 15; [19]*Ind. Med. Gaz.* 1911, 121.

MALTA FEVER. *Leonard Rogers, M.D., F.R.C.P.*

T. L. Ferenbaugh[1] records five cases of Malta fever in South-West Texas verified by serum tests, four of whom were known to have been using goats' milk while some of the herd had "goat fever."

A. Garrow[2] records three years' experience of Malta fever in South Africa, where he found the disease to be common and very variable in its characters, and consequently liable to be overlooked. He gives a full clinical description, and lays stress on white glistening fur on the dorsum of the tongue as being of diagnostic importance. Very chronic cases are common and liable to be overlooked if the serum test is not frequently used, as are cases in which the patient requests treatment for some other complicating disease. The mortality was very low. Sir David Bruce, A. E. Hamerton, H. R. Bateman and F. P. Mackie[3] report the discovery of Malta fever in a part of Uganda, where it was known locally under the name of "Muhinyo." It had previously been reported by different observers as beri-beri, dengue, and kala-azar respectively. In May, 1909, Sir David Bruce and A. D. P. Hodges went to the borders of Ankole, on the eastern shore of Lake Albert Edward, the infected district, and studied 50 patients who had been collected for them. The clinical symptoms and histories of the cases corresponded with those of Malta fever, while spleen punctures proved the absence of kala-azar parasites. The blood gave marked serum reactions for Malta fever, but not for typhoid. The *M. melitensis* was cultivated from the spleens of two cases by means of spleen puncture, thus proving the true nature of the disease, and by inoculating a monkey and a rabbit with the cultures a serum agglutinating Malta fever micrococci was obtained. Lastly, the blood of goats from the infected district was found to clump the *M. melitensis*, while this organism was recovered from two of the goats; thus completing the chain of evidence. Von F. Widal[4] adds another to the numerous recorded cases of Malta fever acquired during work with cultures of the *M. melitensis* in a laboratory.

H. V. Prynne[5] records a case of Malta fever treated with **Vaccines.** The first febrile wave subsided under other treatment, but on recurrence taking place the vaccine was given by the mouth in doses of 2½ millions, and after four doses the temperature fell. After seven days' interval a severe recurrence took place and the same treatment was reverted to on alternate days. After three weeks the fever again ceased, whether naturally or as a result of treatment it is impossible to say. E. H. Ross[5] records the proof of Malta fever at Port Said having been due to infection of goats. The disease was stamped out by testing all imported animals for the disease, and killing those giving the serum reaction.

References.—[1]*Jour. Amer. Med. Assoc.* 1911, ii, 730; [2]*S. Afr. Med. Jour.* 1911, 51; [3]*Jour. R.A.M.C.* 1910, 527; [4]*Wien. klin. Woch.* 1911, Mar. 2; [5]*Jour. R.A.M.C.* 1910, 591; [6]*Ibid.* 1911, 618.

MARASMUS.

For the nutritive value of **Ascitic Fluid** in this condition, *see page* 6.

(*Vol.* 1909, *p.* 424)—If due to digestive weakness, easily assimilated food, such as **Veal** or **Chicken Broth** with sugar, is useful: **Asses' Milk** and **Dried Milk** may also succeed. **Buttermilk** is a convenient form of fat. **Malt** is helpful, more so than cod-liver oil; **Warmth** is important. **Grey Powder** should be given if syphilis is suspected.

MEASLES. *E. W. Goodall, M.D.*

PATHOLOGY.—A few years ago Hektoen[1] showed that the blood of a person suffering from measles contained the infective agent. Quite recently J. Goldberger and J. F. Anderson[2] have shown that certain monkeys can be infected by intravenous inoculation of the blood obtained from a human being, the subject of measles, in the pre-eruptive stage or within twenty-four hours of the first appearance of the rash. At least 50 per cent of the animals experimented upon became infected. "After a variable incubation period of not less than five days, there is a more or less marked rise in temperature, with or without catarrhal symptoms referable to the respiratory passages, such as sneezing and cough, and with or without an exanthem." These observers were also successful in passing the virus through a series of six monkeys. Further, they succeeded in infecting two monkeys by placing them in cages with monkeys who were in the acute stage of the disease. They recall that whereas A. Josias[3] was unsuccessful in his attempts to infect monkeys by contact with human beings suffering from measles, P. Chavigny[4] reported a case in which a monkey caught measles from its keeper. In another series of experiments, Goldberger and Anderson injected several monkeys with the secretions of the mouth, fauces, and nose of patients in various stages of measles. Some of the animals developed measles, others did not. From the heart of one animal which developed measles, blood was taken twenty-four hours after the appearance of the rash. This blood was defibrinated and inoculated by the intravenous method into two rhesus monkeys, one of which developed measles six days later. The results of these experiments indicated that "the mixed buccal and nasal secretions were certainly infective at the time of the first appearance of the eruption, and again forty-eight hours later—that is, early in the fourth day and early in the sixth day of the disease,—and that this infectivity was due to a living virus susceptible of transfer from monkey to monkey by blood inoculation."

SYMPTOMS.—C. A. Barker[5] records six cases of *meningitis* occurring one to eight weeks after an attack of measles. In one case the meningitis was primarily pneumococcic. The other five cases presented the symptoms of post-basic meningitis. One of them recovered. It was not shown to what organism the meningitis was due; and it was a question whether the cerebral affection was caused by, or only followed, the attack of measles.

TREATMENT.—R. Milne[6] advocates for measles the same treatment he recommends for scarlet fever, with an addition. He rubs the patient all over with **Eucalyptus Oil** twice a day for four days, then once a day till the tenth day, and he swabs the throat with 1–10 **Carbolic Oil** every two hours for the first twenty-four hours, very rarely longer. Besides these measures, in measles "a large **Bed-cradle** is placed over the child's head and chest. This is then covered with a **Light Fleecy Gauze,** and sprayed or moistened from time to time with eucalyptus oil. This is done to entangle the phlegm and prevent

the germs in coughing being carried beyond the disinfecting power of the eucalyptus oil." . . . "For the healthy children who have been exposed to infection, I have a little eucalyptus oil sprinkled on their beds at bed-time, and in the morning, noon, and evening a little placed on a handkerchief and carried in their bosom."

REFERENCES.—[1]*Jour. Infect. Dis.* Chicago, 1905; [2]*Jour. Amer. Med. Assoc.* 1911, ii, 113, 476; [3]*Méd. Moderne*, 1898, 153; [4]*Bull. Méd.* 1898, No. 29, 334; [5]*Lancet* 1911, ii, 499; [6]*Ibid.* 1911, i, 1070; *Brit. Med. Jour.* 1911, ii, 501.

MENINGISM. *Purves Stewart, M.D., F.R.C.P.*

It occasionally happens that the physician is called to a patient, usually a child, in whom various signs and symptoms arouse the suspicion of meningitis, and in whom, nevertheless, the subsequent course of the malady proves that it is not true meningitis. For such cases of pseudo-meningitis the designation of "meningism," originally suggested by Dupré, has come into general use. The condition is not a disease, but a symptom-complex which simulates true meningitis, without organic disease of the meninges.

CAUSATION.—(*a.*) *Predisposing.*—In an interesting *resumé* of the subject, Cerrano[1] reminds us that meningism is commonest in children, especially between the ages of 3 and 8 years. This is not surprising when were call the special sensitiveness of the nervous system at this period of life. Children of neuropathic constitution are especially liable, particularly those who have previously been hysterical, emotional, or epileptic. Girls are rather more frequently affected than boys.

(*b.*) *Exciting.*—Infective causes are the most numerous, and this increases the difficulty of diagnosis, inasmuch as true meningitis is also microbic in origin. Certain epidemics of diphtheria are accompanied or followed by meningitic symptoms. Other causes are pneumonia and bronchopneumonia (Roser-Voisin[2]), influenza (Augouin,[3] Leveque[4]), acute articular rheumatism, the various exanthemata, and especially enteric fever (Picini,[5] Grasset[6]). Also other poisons, such as novocain, lead, santonin, mercury, etc., may produce meningism; and the various toxins resulting from gastro-intestinal fermentation occasionally produce effects upon the nervous system which may in several respects resemble the symptoms of meningitis (Rossi,[7] Carrière,[8] Stilo[9]). Dentition and intestinal parasites (Variot[10]) may act perhaps as "reflex" causes, but it is also possible that many examples of so-called reflex meningism, as in constipation, intestinal parasites, etc., are really due to intestinal toxæmia. Occasionally, suppurative affections of the middle ear give rise to symptoms which are suggestive of meningitis, but which rapidly clear up as soon as free drainage of the pus is established. In such cases it is a debatable point whether there has really been a toxic meningeal reaction, or a reflex effect analogous to the meningeal symptoms occasionally produced in neuropathic individuals by labyrinthine stimulation. Hysteria is frequently an underlying factor in meningism. Finally, we have to bear in mind other causes of a physical nature, such as fatigue, exposure to the sun, head injuries, etc.

Morbid Anatomy.—This is a matter of dispute. According to some observers the meninges and cerebrospinal fluid are normal. In certain cases, however, which have died during an attack (from other causes), hyperæmia and œdema of the meninges have been described, and occasionally an excess of cerebrospinal fluid. Such findings, however, would indicate either a serous meningitis or the early stage of a true meningitis rather than mere meningism. Nevertheless, it cannot be denied that there may occur modifications of circulation in the cerebral meninges and in the cortex itself, slight in degree and transient in duration, which may clear up as the meningeal symptoms disappear. Such vascular changes are more likely in toxic varieties of meningism than in reflex or hysterical forms.

Diagnosis.—Meningism, being merely a symptom, and not a pathological entity like meningitis, has no symptoms of its own. All we can say is that symptoms occur which resemble those of meningitis. Nevertheless, certain phenomena that are common in true meningitis are absent in meningism; e.g. coma, motor paralysis, anæsthesia, optic neuritis, marked alterations in the pulse and respiration. Ocular phenomena are rare. Rigidity of the neck, if it occurs, is of short duration. The chief symptoms are those of headache, vomiting, and fever, with restlessness, delirium, and excitement. If such symptoms occur during the course of an infective fever, the diagnosis may be difficult, since true meningitis may complicate some of the infective fevers. A careful consideration of the history will guide us in many cases to a correct diagnosis. The urine should be examined to exclude the possibility of uræmic headache and convulsions, but the conclusive test consists in examination of the cerebrospinal fluid. This should be done microscopically for excess of lymphocytes, or for the presence of polymorph cells, and also bacteriologically for the presence of organisms. The characters of the cerebrospinal fluid in cases of true meningitis are too well-known to require recapitulation here. In meningism the cerebrospinal fluid is normal; and we are justified in giving a good prognosis and in excluding meningitis.

References.—[1]*Gaz. deg. Osped.* 1911, Jan. 15; [2]*Thèse de Paris*, 1904; [3]*Thèse de Lyon* 1895–96; [4]*Thèse de Paris* 1893–94; [5]*Jour. de Mal. de l'Enf.* 1893; [6]*Nouv. Mon. Med.* 1897; [7]*Pediatr.* 1902; [8]*Nord Méd.* 1902, June 15; [9]*Gaz. deg. Osped.* 1903, June 4; [10]*Jour. de Clin. et Therap. Enfant.* 1892.

MENINGITIS, INFLUENZAL. *Purves Stewart, M.D., F.R.C.P.*

Some little time ago influenzal meningitis was regarded as a rare affection, but within recent years, since bacteriological examination of the cerebrospinal fluid has become a routine method amongst neurologists, a steadily increasing number of cases is being reported. The importance of the disease is shown by the fact that it is highly fatal. According to Flexner,[1] the most recent authority on the subject, out of 58 cases in which the influenza bacillus had been demonstrated in the cerebrospinal fluid, no fewer than 52 terminated fatally. Influenzal meningitis is relatively uncommon in adults, most cases occurring in infancy and in childhood. For example,

Prasek and Zatelli[2] recorded a very typical case in an infant, aged eighteen months. Meningitis sometimes follows an influenzal infection of the respiratory tract, but may occur independently of respiratory symptoms. The influenza bacillus is so frequently present in the nasal and bronchial secretions that Flexner considers it highly probable that even the apparently primary cases are really secondary to nasal or bronchial infection. Almost all the cases of influenzal meningitis examined in Flexner's laboratory show bacteriæmia, the bacillus being present not only in the cerebrospinal fluid but in the blood, from which cultures can be obtained.

Wollstein, working in Flexner's institute, injected cultures of *B. influenzæ* into the subdural space by thecal puncture in monkeys, and thereby produced a severe and usually fatal form of meningitis corresponding, clinically and pathologically, to the spontaneous disease as observed in the human subject. These inoculations were undertaken as a preliminary to the production of a **Curative Serum.** Such a serum, Flexner claims, has actually been obtained from the goat. Frequently repeated injections of *B. influenzæ* have yielded an immunizing serum by means of which it has been possible to rescue monkeys which had been inoculated with fatal doses of the influenza bacillus. The serum was administered by thecal puncture for three or four successive days. The result was an arrest of the multiplication of the bacilli, with a diminution of the leucocytosis and a gradual clearing of the cerebrospinal fluid. The bacteriæmia was also abolished, and complete recovery occurred. Flexner and Wollstein are at present preparing the serum for clinical purposes, and hope soon to place it within the reach of the physician. Bacteriological examination of the cerebrospinal fluid in every suspected case is, of course, essential to establish the diagnosis, before the immunizing serum is administered.

References.—[1]*Jour. Amer. Med. Assoc.* 1911, ii, 16; [2]*Wien. klin. Woch.* 1911, 932.

MENOPAUSE.

(*Vol.* 1909, *pp.* 14, 58)—A useful mild sedative for climacteric patients is **Bornyval.** Treatment by **Oophorin** is rational, though its action, if any, is transitory.

MOLLUSCUM CONTAGIOSUM.

(*Vol.* 1910, *p.* 456)—The tumours should be destroyed by **Curettage** or **Incision** or both, and the cavity swabbed with **Tinct. Iodi** or pure **Phenol.**

MORBUS COXÆ. (*See* Joints.)

MORPHINOMANIA. (*See* Narcomania.)

MUMPS. *E. W. Goodall, M.D.*

Symptoms.—Hutinel[1] states that nervous complications are tolerably frequent, due to involvement of both the central system and the peripheral nerves. By lumbar puncture the existence of *meningitis*, usually of a mild form, can frequently be demonstrated. The symptoms of this meningitis are a slight rise of temperature, headache,

insomnia, and general discomfort; and as a rule the pulse-rate does not rise in proportion to the temperature. Meningitis usually comes on two or three days after the parotitis, but may precede it. It is met with especially in young males in whom the attack is complicated with orchitis. "Cerebrospinal fluid withdrawn through lumbar puncture may be clear or slightly opalescent. It contains no fibrin, but there is a larger proportion of albumin than normal. In the centrifugal clot we find mostly lymphocytes with a few polynuclear cells." In exceptional cases the symptoms of meningitis are much more marked and severe (delirium, convulsions, spasm or palsy of various muscles, etc.).

Perineuritis may occur subsequently to an attack of meningitis, or may also independently complicate an attack of mumps.

It has long been known that *orchitis* may be not only a complication, but the sole evidence, of mumps. It frequently results in atrophy of the testis; and, should this be double, the patient will be sterile.

Two cases of an *acute maniacal condition*, with a high temperature, accompanying testicular inflammation after an attack of mumps, have recently been recorded by W. S. Mitchell and Sidney Phillips.[2] Mitchell's case is of interest because the affected testicle was undescended, and but for the history of an attack of mumps a week previously, the nature of the case would probably have not been diagnosed. There was pain on pressure below and to the left of the umbilicus. The left rectus was rigid. The patient violently resisted examination, and had to be restrained. In Phillips's case, first the left, and five days later the right, epididymis was affected. On each occasion the patient was at first violently delirious, but after a few hours fell into a state of stupor with collapse. In Mitchell's case the patient was quieted with $\frac{1}{4}$ gr. of **Morphia** subcutaneously.

For the use of **Sodium Salicylate,** *see page* 37.

REFERENCES.—[1]*Med. Press and Circ.* 1911, Jan. 18; [2]*Lancet* 1911, i, 23.

MYCOSIS FUNGOIDES. *E. Graham Little, M.D., F.R.C.P.*

Pardee and Zeit[1] publish a most carefully recorded case showing premycosic erythema, and tumours clinically indistinguishable from those of mycosis fungoides, in which post-mortem examination demonstrated lymphatic leukæmia, with marked hyperplasia of spleen and glands, and leukæmic lymphomata of lungs, spleen, intestines, liver, and skin. The blood showed marked leucocytosis and lymphocytosis. No improvement resulted from **X-ray Treatment.**

The case is interesting as approximating what seems a clinically clear case of mycosis fungoides to *lymphadenoma*—an approximation urged by the French school. Probably there are a number of diseases able to produce the clinical picture of mycosis fungoides, since microscopic findings have been so various in cases reported under this head.

REFERENCE.—[1]*Jour. Cutan. Dis.* 1911, 7.

MYOPIA. (*See* REFRACTION, ERRORS OF.)

NÆVI. *E. Graham Little, M.D., F.R.C.P.*

Etiology.—Fitzwilliams[1] gives some useful statistics on nævi, using that term in the restricted surgical sense of vascular nævi only. He analyzes some 700 cases, and finds that nævi are twice as common in females as in males; in 83·2 per cent of the cases they were present at birth, in 49·3 per cent the head and neck were the situations affected, in 29·3 per cent the trunk, and 21·2 per cent the limbs. In 9·5 per cent cases the nævi were in the mid-line of the body; in 40·8 per cent cases on the right side; in 49·5 per cent cases on the left. Nævi usually start on the cutaneous surface, and spread in the lines of nerve-supply.

Treatment.—Riddell[2] reports six cases treated with **Radium**; cure was effected in three cases; two were much improved and still under treatment; one had combined **X-ray** and radium. The dosage was prolonged, e.g., a small nævus the size of a sixpenny piece required eleven and a half hours' treatment in two and a half months; another, the size of a pea, required nine applications in as many months. The results are certainly not comparable in convenience and rapidity with those of **Carbon Dioxide** freezing. (*See* Skin Diseases, General Therapeutics.)

Treatment by **Radium** is also referred to on *pages* 78, 79, 80; by **Ionization** on *page* 96.

References.—[1]*Brit. Med. Jour.* 1911, ii, 489; [2]*Glasg. Med. Jour.* 1911, 451.

NAGA SORE. (*See* Zambesi Ulcer.)

NARCOMANIA. *Norah Kemp, M.B., C.M.*

Cocainism (*Chronic*).—In an article on the psychic disturbances of chronic cocainism, Higier[1] points out that in Germany and Poland cocaine is not very commonly used along with morphia and alcohol, and that only during the last twenty-five years, during which time cocaine has been in use as a local anæsthetic, has its abuse arisen. He mentions that cocaine has been shown to resemble closely certain substances which act specially as poisons to the spinal cord, for example, lead, strychnine and the poison of tetanus, and like them it affects the white matter more rapidly and more completely than the grey.

Those who take cocaine for the relief of pain can as a rule give it up easily, but those who use it as a stimulant cannot do so. These latter are the neurotically and psychopathically predisposed, and such a predisposition is frequently found in the intellectual and in those possessed of great ability. As is well known, some people try to substitute morphia for cocaine in order to regain their self-respect, but without good result. According to statistics of cases during the last twelve years in a special sanatorium in Bologna, Sollier states that the percentage of cases of cocaine combined with *heroin* has risen enormously.

Higier refers to certain *symptoms* in themselves diagnostic of cocainism, such as (1) Pigmentation of the injection marks, this being

peculiar to cocaine, (2) Peculiar forms of paræsthesia situated in the trunk, the sensation being that of foreign bodies under the skin, from which the idea that there are cocaine crystals, or fatty particles, or worms, or microbes under the skin is liable to arise ; this will disappear in two weeks on the withdrawal of the cocaine ; (3) Psychic paroxysms —hallucinations like those of atropine or the ordinary delirium of alcohol. If a severe psychic paroxysm is favourably influenced by morphia, this is a sure indication that cocaine had been used. Morphia has little influence in the delirium of alcohol. In cocaine the hallucinations may be so severe as to lead to suicide.

Schroeder[2] considers gradual withdrawal in the treatment of the cocaine habit to be the safest, especially when the patient suffers from abscesses. In such cases sudden withdrawal is dangerous.

Duhem,[3] of Paris, refers to the dangers of the use of *heroin*, owing to the fact that it accumulates in the organism, and mentions also the increasing numbers of heroin habitués. From its constitution Pouchet recognized that the toxicity of heroin is much greater than that of morphia, as it acts more severely on the bulbo-medullary centres. Experiments on animals show that heroin is fifteen times more toxic than morphia for rabbits, and four times more for dogs. The convulsive accidents caused by heroin are independent of the hemispheres, being produced with the same characters in decerebrated animals. The respiratory centre is the one most seriously attacked. Jennings pointed out in 1902 the danger of using heroin as a substitute in the treatment of morphinism, and stated that the craving following its use was more imperious than in the case of morphia.

The difficulty of weaning is very great, owing to the alarming respiratory symptoms which occur during the process. If the rapid method is employed, it inflicts great suffering ; more gradual weaning is to be preferred. During the first few days all may go well, but the weakness and prostration are greater than in demorphinization, with more abundant perspiration. As the weaning progresses, intellectual torpor supervenes, there is slowing of the circulation and respiration, oxidation is imperfect, and attacks of suffocation occur which may lead to respiratory syncope. These attacks may occur insidiously.

The administration of heroin does not remedy matters, but morphia does ; therefore, in the weaning from heroin, **Morphia** should be substituted at once, and should be given in gradually diminishing doses, when no alarming symptoms will occur. **Heart Tonics** are also used, and **Bicarbonate of Soda** to relieve the hyperacidity, and **Hot Air Baths.**

Crichton Miller[4] describes the treatment of *morphinomania* by what he calls the " combined method " of medicinal and moral measures. He considers that any cure of morphinomania should be painless, should, for a time at least, obliterate the craving for morphia, and should be aimed at re-education of the patient's will. In morphinomania there is a physical and a psychical temptation, and sometimes both are present. His plan is to remove the physical craving with as

little distress to the patient as possible, and during that time to render the mind proof against the dominance of physical craving in future; drugs and hypnotic suggestion, therefore, are employed together.

The *details of the treatment* are as follows:—A course of nine weeks in a nursing home or some such institution. Examine the patient in order to ascertain that there is nothing to contraindicate the treatment; secure the patient's co-operation by explaining fully the nature of the cure. During the first three days administer a diminishing number of **Morphia Injections** of diminishing strength, and on the third day the injections should be per rectum. Before each the patient is given a draught containing 5 grams of **Sodium Bromide.** By the end of the third day both bromide and morphia are stopped, the patient by this time being in a comatose or semi-comatose condition, which will last from three to six days.

As soon as the patient is sufficiently sensible, treatment by **Hypnosis** is begun. The patients are hypnotized collectively, a method said to facilitate hypnotization of obstinate cases, and which increases the effect on all those who respond. During this time strict supervision should be exercised over the patient, so that from the second to the end of the seventh week he has no access to drugs. Throughout the two following weeks the patients are allowed to keep their morphine syringes, the hypnotic suggestions are reduced in number, and are specially directed to teaching auto-hypnosis—the power of putting oneself to sleep. During the period of treatment **Heart Tonics,** especially **Sparteine,** are used; **Ichthyol** to prevent symptoms of bromism, and **Alkalies** to mitigate the hyperchlorhydria. Miller lays great stress upon the painlessness and lack of distress which attends his cure, and thinks the patient will therefore be much more willing to submit to it.

Sollier's[5] method of treating *morphinomania*, *heroinomania*, and *cocainomania* consists of three stages.

(1) *Preparation*, lasting about a week, during which time efforts are made to diminish the poisoning by gradual reduction. If morphia and cocaine, withdraw cocaine; if heroin, substitute morphia at once, and purge freely. If the purging is sufficient, the drug can be suspended, otherwise the withdrawal may be attended with serious symptoms. Produce **Diuresis** and **Diaphoresis** by the use of various kinds of baths.

(2) *Withdrawal of Drug.*—Having thus thrown open the excretory channels, and so prepared the way for the hypersecretion which will follow the withdrawal of the drug, withdraw it. There is little danger of syncope, as the heart has no great effort to make. The pains and weakness proper to this period are minimized, because the organism is aided in freeing itself of the poison. Only the muscles, which have no excretory outlet, are the seat of contractions and lassitude, which can be calmed by **Tepid Baths.** During this period **Intestinal Purging** must be pushed until an action of the bowels takes place every four hours. In this way the desire for morphia disappears in twenty-four hours after the last injection has been given.

(3) The *third stage* comprises the week which follows the suspension of the morphia, during which time the organism continues to free itself rapidly of all its toxic elements. The liver is contracted in morphinomania, but it soon regains its normal size and secretes an abundant supply of bile. Desquamation takes place, and the skin resumes its normal colour, albumin disappears from the urine, and abscesses heal.

During the period of baths, douches, and daily purging, **Rest in Bed** is essential. As to **Diet,** starvation is recommended during the first day of withdrawal, giving only citric lemonade, and then coffee and milk as the stomach can bear it. Then increase the food, when the loss in weight is soon made good by the large appetite which the patient develops during convalescence. The excretory channels must still be kept acting freely, or there will be "eliminatory" crises, which cause discomfort to the patient and awaken in him the desire for morphia.

Pettey[6] secures free action of the bowels by the use of **Strychnine** in addition to purgatives. To relieve suffering he uses some member of the **Belladonna** group of drugs.

For the use of **Pantopon** in morphinism, *see page* 31.

Chartier[7] has an exhaustive article on the *condition of the blood* in narcomania. He describes the variations in quantity and quality of the blood corpuscles found during the withdrawal of the drug, variations which resemble very closely the modifications of the blood met with in infectious diseases.

P. K. Pel[8] gives an account of the mental disturbance produced by *tobacco poisoning.* He refers to the fact that small quantities of nicotine given to animals have a peculiar effect on the sympathetic. In his experience he has found tobacco to be a frequent cause of illness. He says that the diagnosis of chronic tobacco poisoning is not easy on account of the variability of the symptoms; in a few cases he had met with mental disturbance. In the case of a boy already referred to, a striking alteration had taken place in the boy's disposition. He had been amiable, diligent, and obedient before the tobacco poisoning, but became bad tempered, absent minded and disobedient afterwards. From time to time disorientation and hallucinations had been present. He treated the case by providing free excretion and withdrawing the drug.

References.—[1]*Münch. med. Woch.* 1911, Mar. 7; [2]*Berl. klin. Woch.* 1911. Feb. 13; [3]*Med. Press,* 1911, Feb. 22; [4]*Brit. Med. Jour.* 1910, Nov. 19; [5]*Gaz. deg. Osped.* 1911, Feb. 26; [6]*N.Y. Med. Jour.* 1910, Nov. 5; [7]*Sem. Méd.* 1911, June 9; [8]*Berl. klin. Woch.* 1911, Feb. 6.

NASAL ACCESSORY SINUSES.

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Etiology and Pathology.

Ethmoid Disease.—Stenger,[1] in an article on the indication for intranasal operation and opening of the ethmoid cells, reports two cases where pieces of cotton left in the nose have brought about troublesome and, in one case, fatal symptoms. In the first, sent to the author as a case of ozæna, examination showed a piece of cotton

between the bulla and the middle turbinate almost covered over with granulations. In the second, the cotton was in the same place, but shutting off the drainage from the frontal sinus, in which, as a result of this, a purulent inflammation developed. This led to osteomyelitis of the skull, meningitis, and death.

Ethmoiditis, Pathology of.— Skillern[2] differentiates two types of ethmoiditis on pathological as well as clinical grounds, as in the following table :—

Chronic Hyperplastic Ethmoiditis	Chronic Purulent Ethmoiditis
Secretion clear and watery	Secretion purulent
Inferior turbinate hypertrophied	Inferior turbinate atrophied
Never crust formation	Always crust formation
Headache most prominent symptom	Headache often light or absent
Ophthalmic manifestations due to pressure of hypertrophic mucous membrane on vessels	Ophthalmic manifestations due to infection from purulent secretion
Gastric disturbances absent	Gastric disturbances frequent
Neurasthenic symptoms predominate	Neurasthenic symptoms not marked if flow of secretion be free
Hyperplastic Type	**Suppurative Type**
Metaplasia of ciliated epithelium into squamous only where parts have come into contact with other structures	General metaplasia where secretion comes into contact with mucosa
Meshes of subepithelial connective tissue dilated	Subepithelial connective tissue shows fibrous formation
Round-cell infiltration scanty	Round-cell infiltration well marked
Glands hypertrophied primarily	Glands primarily atrophied
Reabsorptive changes in bone predominate	Apposition of bone predominates

Sphenoid.—Comrie and Fraser[3] have made post-mortem examinations in fifty cases, and find that naked-eye examination of the contents of a sinus is not a reliable guide to the presence of accessory sinus suppuration : histological examination is the only true guide. Chronic suppuration is not commonly found post mortem in the sphenoidal sinus. Slight degrees of catarrh of the mucous membrane of the sphenoidal sinus are fairly common. Mucous glands and erectile tissue are frequently present in the submucous layer of the sphenoidal mucous membrane.

Head Injuries and Nasal Disease.—Ziem[4] reports three cases showing the necessity of careful examination of the nose and sinuses as well as the ear after injuries to the head. He cautions against using the galvano-cautery on the swollen mucous membrane, as likely to drive blood back into the fore-brain, increasing the nervous trouble. He

Douches the nose and superior parts with salt water, and thinks that in all the earlier stages of lesions of the head and fractures of the base of the skull such douches, carried out with due care, will give good results. Memory is improved and dreams are diminished by this treatment.

Troubles of equilibrium without involvement of the ear are not rare in affections of the nose and sinuses, and are due to secondary disturbances of circulation in the anterior part of the brain.

Complications.

Visual Fields.—Wallis[5] has studied the visual fields in a large number of patients who had diseases of the nasal accessory sinuses associated with ocular symptoms, and concludes that peripheral field contraction was present in every case, and that marked temporal, particularly bitemporal, contraction, and bitemporal hemianopsia, are characteristic of chronic sinusitis of the posterior group. This is due, in the absence of ophthalmoscopic changes, to the direct action of toxins upon the nerve by contact.

Peripheral contraction in the presence of gross neuritis is due to pressure from inflammatory œdema within the optic canal, and in "fine" neuritis to pressure from hydrops vaginæ nervi optici, both resulting from the action of toxins whose amount and intensity may be measured by the degree of field contraction and fundus change.

Central scotoma probably occurs in acute sinusitis; it results from pressure, and, possibly in part, from the local action of toxins. The differences in the ocular symptoms of acute and chronic sinusitis depend upon the amounts of toxin reaching the nerve; in the latter it soaks through the sinus walls slowly in small quantities; in the former it is carried more rapidly, and in a large measure by the vessels.

Treatment has its most beneficial effect on the contraction of the fields when the suppurations are acute and optic neuritis is present. Operative treatment may cause temporary diminution of the visual fields. Ring scotoma may result from sphenoidal sinusitis. To this may be added the observations of MacWhinnie,[6] that following operative procedures scotomata disappear before the enlargement of the field takes place; that there is contraction of the field of vision always for red, and perhaps for white; and that absence of pus in the nose, with or without proptosis, does not indicate a normal sphenoid.

Optic Neuritis.—Harmon Smith[7] has found some cases of optic neuritis to be benefited by **Operation** upon the sphenoidal sinus and posterior ethmoid cells, especially where there was but slight local evidence of sinusitis.

His method of procedure is to remove the middle turbinate with the cold snare, and the lower and anterior walls of the posterior ethmoidal cells with forceps and curette; to enter the ostium of the sphenoidal sinus with a probe, and curette away the anterior wall from this point downward, until sufficient space is made to employ a sphenoidal forceps, when the entire wall can be removed if necessary. (See also Onodi.[8])

Acute Otitis Media.—Otologists agree that the infection in a large percentage of cases of acute otitis media proceeds through the Eustachian tube as a result of acute rhinitis and acute nasopharyngitis. Coakley[9] believes that the severer types of acute rhinitis accompanied by acute infection of the nasal accessory sinuses are far more apt to be complicated by aural disease than the milder types of acute rhinitis.

It is extremely rare for a patient with acute sinus disease, before acute otitis media has developed, to develop the latter subsequently during treatment. Early recognition and treatment of acute sinus disease will therefore prevent many a patient from developing acute otitis media. The fact that acute otitis media usually occurs on the same side as the sinus disease suggests that pus from the various sinuses bathes the pharyngeal orifice of the Eustachian tube, and thus infects the tympanum.

Cases of acute otitis media, associated with sinusitis, are more likely to develop such a degree of mastoiditis as to require a mastoid operation, than other cases of otitis. Acute otitis media is much less likely to arise in chronic than in acute sinusitis. This may be accounted for in two ways. The bacteria found in the pus in many cases of chronic sinusitis seem to have lost much of their virulence. Should they be forced into the tympanum through the Eustachian tube, they may not infect the ear. It is also probable that the antibodies formed in the chronic cases prevent further infection. After any operation, intranasal or external, on a case of chronic sinusitis, the virulence of the bacteria is greatly increased, owing to the wound secretions forming an excellent nutrient medium; hence the cellulitis or erysipelas which develops after some of the external operations in cases of chronic nasal accessory sinus disease.

Intracranial Suppuration.—Onodi[10] has collected 106 cases of brain abscess complicating suppuration of the nasal sinuses; 82 of these were secondary to frontal sinusitis, 11 to ethmoidal disease, 4 to antral suppuration, and 1 to sphenoid disease. Twenty-five cases of cured extradural abscess following frontal sinus suppuration are on record, among which is one in which exploratory puncture of the brain had been performed with a negative result. In 7 of these cases the posterior wall of the frontal sinus had been perforated, and in 11 it was diseased. In 20 of the cases of brain abscess the posterior sinus wall had been perforated, and in 57 it was diseased. In the majority the abscess was situated in the frontal lobe; three times it was found in the temporal lobe, once in the pedunculus cerebri, and once in the cerebellum. Of these 106 cases of brain abscess, 12 recovered as a result of operation, and 29 died in spite of operation.

Exposure of the cranial cavity through the ethmoid cells in life had not yet been carried out. There are two **Per-nasal Operations** which have been performed upon patients, namely that of Schloffer, through the ethmoidal cells after displacement of the external nose; and, secondly, the endonasal route, first performed by Hirsch.

Hirsch has collected in all 37 cases operated on, and to these Onodi has added 8 more. Eighteen of these 45 cases died. Hirsch adopted the endonasal route in 7 cases, and in 6 of these he performed submucous resection of the septum so as to reach the anterior wall of the sphenoidal sinus and expose the pituitary region by opening up the sphenoidal sinus. In 5 cases the operation was successful. Kocher has modified this operation by displacement of the nose, subsequent septal resection, and opening up of the sphenoidal sinus.

Onodi's researches show that puncture of the brain through the frontal sinus should not be performed more than 18 mm. above the level of the floor of the anterior cranial fossa, otherwise the needle might encounter the lateral ventricle or the basal ganglia. Below this level it is possible to insert the needle 4 or 5 cm. backwards and laterally. Abscess, when present, is usually situated in this lower region. On the convex surface of the anterior part of the frontal lobe in the neighbourhood of the frontal sinus the needle would enter the lateral ventricle and the ganglia if it were inserted 20 mm. above the base of the brain, and pushed backwards sagittally to a distance of 30 to 40 mm. For this reason the needle should not be pushed deeper than 2 or 3 cm. But if it were necessary for the needle to reach to the neighbourhood of the cortical centres—the pre-central convolution—or of the internal capsule, then it might be inserted at a point 4 cm. above the base of the brain, and passed in an upward and backward direction so as to reach the pre-central convolution, which lies some 8 to 10 cm. distant. The point described in brain surgery as the lower point for puncture lies 4 cm. above the middle of the supra-orbital margin. Only in a very few cases does this point lie in the neighbourhood of the frontal sinus. He had found only four cases out of 1200 skulls examined in which the frontal sinus extended upwards as far as this.

Treatment.

Killian[11] treats acute inflammations of the sinuses by inducing active hyperæmia with an **Electric Light Bath.** The apparatus, first constructed by Brunings, consists of a box which, with the patient in recumbent position, is placed over his head. In the interior are four electric lamps, so set that their rays are directed against the face. The eyes are protected by a heavy leather eye shade and layers of gauze if needed. A glass tube is provided for breathing through the mouth to the outside air. This air is moistened. The current is first turned on two lamps, then on four, the temperature rising to 60°, 70°, 75°, 80° C. The patient remains in the bath ten minutes. First two lamps are turned out, then two more, and the temperature slowly goes down. Treatment is given once, twice, or three times daily. The pain is relieved, and Killian considers the results excellent. At the same time **Sodium Iodide** is given to increase the secretion, and **Aspirin** for the pain. Complete healing occurs in one to two weeks.

Killian's **Radical Operation,** for chronic cases only, is as follows. General anæsthesia is always used. The incision is made in the eyebrow, and carried to the side of the root of the nose along the frontal process of the upper jaw, down to the lower border of the nasal bone. The skin and periosteum above and below the incision over the orbit are separated. This separation is carried into the orbit as far as the tear canal and to the paper plate of the orbit. The tear sac is separated from its attachment, and the whole lower border of the frontal sinus laid bare as far as it is possible to do so. The resection of the anterior wall of the frontal sinus, the frontal process of the superior maxilla, the tear bone, and, when necessary, a portion of the paper plate as well as the entire floor of the frontal sinus, follows. Only the upper border of the orbit remains in the form of a bridge of bone. The mucous membrane is carefully removed from every crevice and furrow. The anterior, middle, and, when necessary, posterior ethmoid cells are curetted with a sharp spoon to convert them into a single, smooth-walled cavity, the mucous membrane of which has been removed, and opening widely into the nose.

If the sphenoidal sinus is diseased, its cavity is freely opened and curetted. The anterior portion of the middle turbinate is drained and cut off as well as all the mucous membrane which covers the frontal process. The entire cavity is washed out with peroxide of hydrogen in the region of the ethmoid cells, and a piece of rubber sponge is laid which reaches to the choanæ of the nose. This is removed on the next day. The skin is sutured on the third or fourth day. Only in the presence of simple mucous catarrh is primary suturing done. Often it is necessary to operate on the antrum and frontal sinus at the same time, in which case the antrum is operated upon first.

Several deaths have followed this operation. These have been due either to fatal complications, which were already present before the operation, or to failures in technique. The region of the olfactory fissure has not been sufficiently protected. This is very necessary, since the fibres of the olfactory nerve are accompanied by lymph-vessels which are in direct connection with the subdural spaces. For this reason virulent pus can very easily infect the opened fissures, and set up a purulent meningitis. Occasionally osteomyelitis of the skull bone follows the primary suturing; this is avoided by the secondary plan of suturing. Careful attention must be given to the supra-orbital nerve. If this is in the cicatrix, neuralgia may be produced, which necessitates resection of the nerve. The operation is not to be done if the patient suffers from ozæna.

Suction. — Pratt[12] urges the use of suction by means of a vacuum pump for curing infections of the nasal accessory cavities, and also for the middle ears. The technique is very simple. The patient's nasal cavity is thoroughly cleansed, and then sprayed with a 2 per cent cocaine solution to contract the tissues and render the sinus opening more patulous. After the pump is attached to the water faucet, the patient is instructed to close one nostril and insert the nasal tip in the

other; by swallowing, the soft palate is raised and closes off the the nasopharyngeal space, while the suction of the pump holds the velum tightly in place. As soon as the patient feels the suction he should open his mouth, allowing the tongue to lie perfectly relaxed, and breathing through the mouth.

In middle-ear diseases in which there is a patulous tube, the vacuum-pump is of inestimable value, as the secretions of the middle ear, antrum, and even mastoid, are easily drawn into the throat, the natural drainage spot, if there are patulous openings. With suppurating otitis media with perforation, the condition of the tube may be ascertained by inflation.

A suction-pump should never be applied to the external meatus, because while by this means the secretions are drawn from the middle ear and its adjacent cavities, one is also apt to draw germs and secretion from around the pharyngeal opening of the Eustachian tube up into the middle ear, and thus to re-infect or doubly infect that cavity.

REFERENCES.—[1]*Deut. med. Woch.* 1911, 1587; [2]*Jour. Amer. Med. Assoc.* 1910, Dec. 17; [3]*Edin. Med. Jour.* 1910, Nov.; [4]*Jour. Laryngol.* 1911, Mar.; [5]*Laryngol.* 1911, May; [6]*N.Y. Med. Jour.* 1910, Aug. 13; [7]*Ibid.* 1911, ii, 276; [8]*Berl. klin. Woch.* 1911, 1592; [9]*Amer. Jour. Med. Sci.* 1911, Feb.; [10]*Laryngol.* 1911, 435; [11]*Deut. med. Woch.* 1911, Ap. 20; [12]*Jour. Amer. Med. Assoc.* 1911, Mar. 18.

NECROSES. (*See* BONE, DISEASES OF.)

NEPHRITIS. *Francis D. Boyd, M.D.*

Nephritis and Tonsillitis.—Loeb[1] points out that acute nephritis is a frequent sequel of tonsillitis, a fact generally overlooked. He records four cases, in all of which the nephritis assumed a hæmorrhagic, non-scarlatinal type. There was no pyrexia and no great œdema. The patients were either physicians or else closely related to physicians, and presumably, therefore, great care was taken in observation. Yet there was no suspicion of a nephritic condition until the disease was well advanced and the tonsillitis over. In every case diphtheria and scarlet fever could be positively excluded. The tonsillar inflammation was mild in character and the course unusually slow.

Syphilitic Nephritis.—Nádor[2] points out that syphilitic nephritis can and does occur. The syphilitic origin of the attack may be assumed if the kidneys were perfectly healthy before the infection, if with the occurrence of albumin and casts in the urine and œdema of the tissues there are undoubted symptoms of syphilis, and if the nephritis yields to antisyphilitic treatment. In Nádor's patient, a young woman aged 26, the nephritic symptoms did not clear up until after treatment with **Salvarsan,** which also caused the disappearance of a positive Wassermann reaction.

A fatal case of secondary syphilitic nephritis is recorded by Hall and Beattie.[3] In their patient, a young man, whose acute nephritis developed during the secondary stage of syphilis, the output of urine was greater than would have been expected in an ordinary case of

nephritis with the same amount of dropsy. There was definite evidence that the number of casts was less than usual in a simple acute nephritis. The striking feature of the case seemed to be its obstinacy, and the persistence of dropsy in spite of rest, diet, and active treatment. Specific treatment by mercury, though administered by intramuscular injection, inunction, and by the mouth, failed to produce any evident improvement.

Specific Treatment of Nephritis.—Arcangeli[1] remarks that it is a first principle that if there is a specific cure for infectious disease it should be employed, whether or no nephritis exist. He describes two cases of acute nephritis with rheumatic arthritis, one with malaria and one with syphilis, where energetic specific treatment with **Salicylates, Quinine,** and **Mercury** respectively cured the specific disease and the nephritis. The same principle applies to **Diphtheria Antitoxin.** With old-standing syphilis the diagnosis should be controlled by the Wassermann reaction, else harm may follow mercurial treatment. In infections which have no specific medication, vaccines should be tried. Excellent results are recorded with **Vaccines** in cases of puerperal sepsis and in streptococcic septicæmia with acute nephritis. He deprecates the use of hot applications, and advises the use of cold baths in typhoid nephritis.

Concentration of the Blood.—Widal,[5] in a lengthy communication, discusses the importance of estimating the concentration of the blood in nephritic cases. He makes use of the *refractive index* as obtained by Pulfrich's immersion refractometer as modified by Reiss. The results obtained very closely correspond to those got by the gravimetric method. Different observers have confirmed the observation that variations of the refractive index translate exactly the variations in the serum dilution. Tuffier and Manté found that the limit of error was only 0·23 per cent. The blood for the observation can be taken from the finger or from a vein and received in a small tube, which is sealed to prevent evaporation. Coagulation should take place naturally, and the observer should wait for complete contraction of the clot before making the test. To obtain accurate results, the observation should be carried out within twenty-four hours. Widal, on nephritic patients, compared the course of the refractive index with the curve of weight. In an œdematous patient, by daily observing the weight, one can estimate the degree of infiltration of the tissues, and by the refractive index the degree of hydræmia of the blood. This last varies with the œdema of the tissues; as œdema is disappearing and the body weight is falling, the refractive index rises, and the rise proves that the blood is becoming more concentrated; but the fall in weight precedes the rise in the index by a varying period of one to ten days. The fluid which impregnates the tissues disturbs nutrition. Under the influence of a diet poor in common salt, when diuresis has freed the tissues of œdema, the subject is found to have lost not only fluid but tissue. The weight may rise again under a more generous diet, and it is then

that the index becomes of grave importance, as showing whether the rise in weight is due to improved nutrition or recurring œdema. Lowering of the index shows return of œdema ; a stationary index shows increased weight due to improved nutrition.

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NEURALGIA.

For the use of **Hydropyrin**, *see page* 19 ; **Ionization**, *page* 96.

NEURALGIA, PHRENIC.

Purves Stewart, M.D., F.R.C.P.

Too commonly it has been taught that the phrenic nerve is purely motor. This view, however, is quite erroneous. Ferguson[1] some twenty years ago demonstrated the presence of sensory fibres in this nerve, and his discovery has been confirmed by the observations of Sherrington[2] and others. These sensory fibres are distributed to the diaphragm, to the extra-pleural and extra-pericardiac connective tissue, and to the suprarenal body of the corresponding side. In addition, the right phrenic supplies fibres to the liver and its subperitoneal covering, also to the inferior vena cava and the right auricle. Moreover the phrenic nerve has numerous connections with other nerves, both splanchnic and spinal, notably with the intervertebral ganglia of the lower cervical roots, from the 3rd to the 6th cervical.

Bearing in mind the foregoing anatomical points, it is easy to understand why in certain diseases within the territory of the phrenic nerve, the patient complains of reflected pain at the tip of the shoulder on the corresponding side, often accompanied by cutaneous hyperæsthesia. Thus, for example, shoulder-pain may be a diagnostic feature in diaphragmatic pleurisy,[3] in gall-stones,[4] in hepatic abscess,[4] and in suprarenal growths.[5]

REFERENCES.—[1]*Brain*, 1891, 282 ; [2]*Jour. of Phys.* 1894, 255 ; [3]Kidd, *Rev. Neurol. and Psych.* 1911, 587 ; [4]MacKenzie, *Symptoms and their Interpretation*, 1909, p. 46 ; [5]Mayo Robson, *Brit. Med. Jour.* 1899, 1100.

NEURALGIA, TRIGEMINAL.

(*Vol.* 1911, *p.* 92)—Even the severest cases, resisting all other methods, may be relieved and even cured by **Ionization with Sodium Salicylate.**

NEURITIS.

This term is now indiscriminately applied to cases of myalgia, reflex neuroses of arthritic joints, brachial and cephalic neuralgias, sciatica, rheumatism of sheath of nerves, traumatic injuries of nerves, rheumatism of fibrous tissues, etc., etc. The proper therapeutic indications can only be reached by a more exact diagnosis of the actual pathological condition from which the patient suffers.—[ED. *M.A.*]

Cacodylate of Sodium for (*page* 10).

NOSE, DISEASES OF. *Geo. L. Richards, M.D., Fall River.*

Congenital Atresia of Choanæ.—Fraser[1] adds one more to the list of cases reported, his being especially complete, as it came to autopsy, and complete measurements are given. The left choana was closed by a vertical plate of bone about the middle of the nasal cavity. The two antra were of equal size, which would seem to disprove the theory that the development of the nasal accessory sinuses is due to the pressure of air currents in the nose.

Ozæna (Atrophic Rhinitis).—Fraser and Reynolds,[2] from a study of 138 cases of ozæna, have reached the following conclusions:—

No clear line of demarcation can be drawn between chronic purulent rhinitis and ozæna. It usually begins early in life as a hypertrophic catarrh of the nasal mucous membrane; the inferior turbinal is most severely affected, and has frequently gone on to atrophy while the middle turbinal is still in the hypertrophic stage. The most common causes are the exanthemata, coryza in infants, and syphilis. It leads to various changes in the nasal mucosa, notably metaplasia of large areas of the superficial ciliated epithelium into squamous epithelium; dense small-celled infiltration of the submucous tissue (most marked in the superficial layers); catarrhal changes in, and atrophy of, the mucous glands; diminution in size and number of the cavernous blood-spaces. In many cases there is atrophy of the turbinal bones, especially of the inferior turbinal; in some, arterial disease, and in the majority, sclerosis of the deeper layers of the submucous tissue. These changes have their counterparts in the mucous membrane of the accessory sinuses in certain cases of chronic suppuration, in the middle-ear cleft in certain cases of chronic suppurative otitis with cholesteatoma formation, and in the bronchi in chronic purulent bronchitis and bronchiectasis. Various micro-organisms give rise to the first stage of ozæna, i.e., to acute and subacute purulent rhinitis—*Micrococcus catarrhalis, Pneumococcus, Staphylococci, Streptococci*, etc. The characteristic picture of ozæna is probably only produced when the *B. mucosus ozænæ* is present. Ozæna is more likely to develop in a congenitally roomy nose than in a narrow one, on account of the greater tendency in the former to stagnation and consequent putrefaction of the secretions. Atrophy of the nasal tissues may be due to the pressure of the crusts, and to vascular or sclerotic changes; but is probably mainly due to toxic influences. Tubercle and syphilis are concerned in the production of ozæna, in that they may lead to chronic purulent rhinitis. Accessory sinus suppuration is not the cause, but a complication, of ozæna. Ozæna not infrequently occurs in several members of the same family, and there are some grounds for regarding it as a contagious disease.

Nasal Obstruction in Children.—In average school-children (469 cases, 106,500 tests) the *articulatory capacity* for consonants was found to vary with the degree of nasal obstruction (Ernest Jones[3]). This variation is not very close, but is more decided with boys than with girls. In children with gross articulatory defect or dyslalia (231 cases,

52,000 tests) no correlation whatever was found between the extent of this defect and the degree of nasal obstruction present.

Nasal Reflex Neuroses.—Killian[1] distinguishes two main varieties, respiratory and olfactory, the former originating in the trigeminal fibres which have no terminal corpuscles, but which lie quite near the surface of the mucous membrane, and are easily affected by various stimuli which could cause a reflex. Any change in the physical or chemical constitution of the inspired air may act as an irritation of this sort; but the most common factor consists in mechanical or chemical irritation by dust, smoke, and exhalations. According to Keyser, tickling and pain are the two basic sensations of the respiratory nasal mucosa. Electric, chemical, and thermic irritation all cause these. The ordinary degrees of irritation cause only tickling or itching.

As a test for this sensation in the nasal mucosa, Killian uses a cotton thread (Brookes, 100) 7 mm. long, fastened to a probe. When applied so as to allow 2 to 3 mm. to come in contact with the surface to be tested, a pressure of 6 mgrams is exerted. The feeling of tickling is increased with the length of the section stroked. Three mm. is a convenient stretch which can be conveniently tested in the nasal passages, except perhaps toward the posterior nares, as we have to avoid carefully any contact with points further forward. Thick, coarse thread causes little or no tickling in normal noses, and stiff instruments, as wires, cause painful sensation only. The normal nasal mucosa is a little less sensitive than the skin of the forehead. Certain sections in the anterior nares, especially the two tuberculous septi and the areas in front above the anterior end of the inferior turbinate, seem to be particularly sensitive. Irritation of even these "four points" of Killian causes only a desire to sneeze without actual sneezing in normal conditions. The lack of reflexes on irritation with the test-thread is characteristic of a normal nasal mucosa. In case of marked contamination of the inspired air, causing repeated sneezing, normal individuals try to escape from the irritating factors, if possible, so that a nasal reflex neurosis cannot well develop on the basis of a normally sensitive respiratory mucosa. For this, a morbid hyperæsthesia is required, as indicated, on testing, by reflex attempts to escape from the tickling, facial contortion, rapid onset and long duration of tickling, and intense concomitant symptoms, such as hyperæmia, hypersecretion, swelling up of the inferior turbinal, and in extreme cases lacrymation, injection of the ocular conjunctiva, coughing, sneezing, photophobia, headache, and so on. Each and every one of these reflexes has a number of subdivisions, differing in degree. Even attacks of asthma may be induced as a reflex. The whole picture is striking, and certainly impresses one as based on hyperæsthesia. The "four points" are most irritable in hyperæsthetic as in normal noses. The hyperæsthesia varies greatly in the same patient from time to time, and is generally more marked in dry, hot weather. It is commoner in large cities than elsewhere, takes a year or two to develop, may be encouraged by a neuropathic

habit, and is generally lasting in spite of temporary relief and improvement from climatic cures. Hyperæsthesia is undoubtedly present, almost if not all the time, in vasomotor rhinitis and hay-fever subjects. In the latter cases it may be found, without a doubt, long before the time of the attack.

Hyperæsthesia becomes established by repeated action of all the slight irritative factors. The organism reacts more and more easily to repeated stimuli as the reflex paths become used to the procession of nervous phenomena. Finally a minimal stimulus, which may not even attract attention and may be quite subconscious, suffices to discharge the reflex. Hyperæsthesia may be present without actual reflexes, and is itself to be considered a neurosis. The reflexes originating in the ethmoidal region may be local, regionary, i.e., covering the distribution of the trigeminal nerve, or distant. Of regional reflexes we may again mention the various ocular reactions, headache, and fullness in the brow (dural branch) and frontal sinuses. Sneezing is the characteristic of ethmoidal reflexes, and cardiac action can also be influenced by stimulation of this area. The sphenoidal reflex sneeze is generally less ready, but nasal cough is easily induced. Itching and burning in the posterior nares, pharynx, and palate; neuralgias, headache, and vasomotor and pseudo-erysipelatous reddening and swelling of the cheeks indicate irradiation of the stimulus into some of the various other nerve regions with which the sphenoethmoidal filaments are connected. The ganglionic and sympathetic interrelation is particularly close. The reflex action on heart and respiration is important and interesting. It may go by way of the trigeminus and the cerebrum, or direct *via* the sympathetic axis. As to olfactory neurosis, little is known.

Treatment.—This must be directed to the hyperæsthetic region, be it the ethmoidal, the sphenoidal, or the olfactory, so that the anatomical division is of practical importance. It varies from applications of **Cocaine** and similar anodynes, to superficial destruction of irritable areas with **Trichloracetic** or **Chromic Acid,** or even complete extirpaton with **Electrolysis** or **Galvano-cautery,** attacking only those areas which careful examination has shown to be hyperæsthetic. **Cauterization** of the " four points " with trichloracetic acid is valuable in ethmoidal neuroses. For severe and inveterate forms, unilateral or bilateral **Resection of the Ethmoidal Nerve** from the orbit has been recommended, of late, by Eugene Yonge, as originally suggested by Zuckerkandl. Extranasal ethmoidal neurotomy has of necessity to be bilateral and requires general anæsthesia. The patients rarely consent to this. An intranasal resection has been devised, dividing the septal branch above at the septum, and the lateral branches somewhat above the anterior end of the inferior turbinate, with a small triangular lancet bent at a right angle. The sphenopalatine nerve, whose septal branch can be reached directly above the choanæ, can be divided with scissors or a small lancet. The palatine branches to the inferior turbinate can best be reached by rather extensive removal of its mucosa. Purely

olfactory neuroses cannot be treated with caustics, but attempts might be made to use substances, of which there are many, having a slight and superficial injurious effect on this special mucous membrane.

Hay Fever. — Noon[5] has been experimenting with **Prophylactic Inoculations** against hay fever. The condition of hay fever is considered as due to pollen toxin, and the theory of Dunbar is sustained. The results with Dunbar's pollantin are, however, but moderately good, cures being obtained only in exceptional cases. A pollen serum was prepared after the method of Dunbar, by extraction with distilled water aided by freezing and thawing several times. The extracts were then sealed and boiled. Timothy grass was found to yield the most active extract. One gram of this pollen was extracted with 50 c.c. of water. One drop of a 1–5000 dilution of this extract is sufficient to excite a distinct reaction in the conjunctiva of the more sensitive patients. The patient's resistance is measured by observing the strength of pollen extract necessary to excite a conjunctival reaction. Sensitive patients react to four units, while normal individuals fail to react with 2000 units.

The unit is the quantity of pollen toxin which can be extracted from ·001 mgram of phleum (Timothy pollen). The patients were immunized by subcutaneous injections of **Pollen Extract.** With minute doses the resistance of the patients rose rapidly; then, as the dose increased, the resistance ceased to rise, and even went back towards its original value. Ultimately a stage is reached at which the resistance ceases to rise.

The result of these experiments so far is to show that the sensibility of hay-fever patients may be decreased, by properly directed dosage, at least a hundredfold, while excessive or too frequent inoculations only serve to increase the sensibility. It still remains to be seen whether the immunity thus attained is sufficient to carry the patients through a season without suffering from their annual attacks of hay fever. Patients are under observation who have undergone treatment for periods varying from a few weeks to eight months.

In three cases[6] in which **Resection of the Ethmoidal Nerve** was performed, the results were good one year afterwards. The variety of remedies proposed and in use shows how very unsatisfactory the treatment of this affection is.

Collapse of Alæ Nasi.—Halle[7] thinks that many persons suffer from inability to breathe through the nose on account of deformities of the alar cartilage and of the quadrangular cartilage of the septum. He describes several operations for the cure of this, varying as the cause is in the alar cartilage or in the septum. If the cause is in the bend of the septum, sufficient to be removed, he corrects it by methods in use in the submucous resection of the septum. [Many apparent failures after adenoid and nose operations are due to the same trouble, viz., collapse of the alæ in inspiration. After many operations which from an anatomical standpoint are successful, the difficulty in breathing is due to too forcible inspiration. Persons accustomed to breathe through the mouth, where a large quantity of air is drawn into the

lung rapidly and without effort, find it difficult at first to adjust their breathing to the slower inspiration through the nose. An explanation of this fact and the reason therefor will often bring about success from the patient's standpoint.—G. L. R.]

Tuberculosis of Nose and Pharynx. — Pfannenstill[8] reports several cases of superficial tuberculous infection, successfully treated by inhalation of **Ozone** combined with internal administrations of **Iodide of Sodium.** While the cases reported all reacted to the Wassermann test, a syphilitic history was negative, nor did the cases improve under the ordinary syphilitic treatment.

One case was diagnosed as lupus of the pharynx and larynx, tubercle bacilli being found in the pharyngeal ulcerations, and treated for one year unsuccessfully. Six months later she came under the care of the writer. At the end of eighteen months, treatment was stopped with the patient apparently cured. No recurrence had taken place one month later. In another case, in which the ozone-iodide treatment was applied to a syphilitic, there was a check to the extension of the affection. A third patient was unable to breathe through the nose on account of a lupus-like ulceration of the septum. The case rapidly improved under the ozone-iodide treatment. The ozone is administered by an inhaler, with two tubes, one carrying ozone, the other air. A slight ulceration is necessary to allow the ozone to penetrate.

Lupus of the interior of the nose is treated by Strandberg,[9] of Copenhagen, after the method of Pfannenstill, the object of which is to kill the bacteria in tuberculous tissue by introducing a bactericidal body (nascent iodine) directly into the diseased tissue. The patient is given daily 45 gr. of iodide of sodium divided into six doses. At the same time the nose is filled with absorbent gauze moistened with peroxide of hydrogen, a tampon being inserted every morning and kept saturated by means of a pipette. It must be so applied as to be in absolute contact with all the diseased area.

Of thirteen cases so treated, all but one showed good results, and in nine all symptoms disappeared. The duration of after-treatment given varies from five days to three months.

Malignant Disease of Nose.—Stuart Low[10] says that pain is not to be relied upon as an indication of malignant disease in the nose. Increasing and persistent stuffiness, especially if unilateral, is an important diagnostic point. Recurring and increasingly severe hæmorrhage, especially if unilateral, is always a suspicious symptom. Thorough and systematic examination is imperative in all obscure cases of nasal disease, with early removal of a piece of any obstruction in the nasal passages for a pathological report. When there is malignant disease, early operation as soon as possible after a diagnosis has been made is essential to secure a successful removal. The canine fossa route is preferable in extirpation of intranasal tumours. Innocent and malignant polypi are likely to co-exist.

Nasopharyngeal Fibromata.—Guthrie[11] removes the growth by passing a strong periosteal elevator through the nose and, with the aid

of the finger of the other hand in the nasopharynx, separates the attachment of the growth. To get room enough for the elevator, an incision is made through the mucoperiosteum covering the inner aspect of that portion of the superior maxilla which forms the outer margin of the pyriform aperture, and sufficient of its bony margin is removed for this purpose with punch forceps. A preliminary laryngotomy is performed, a tube is inserted, the pharynx plugged with a sponge, and the nasal portion of the operation is then done and the elevator introduced. During separation, the sharp edge of the elevator (a small semi-sharp straight periosteal instrument) is kept close to the bone, so as to leave the latter quite bare after removal of the mass from its place of attachment. The mass is removed either through the nose or the mouth, with grasping forceps. The laryngotomy tube is removed at once and the wound closed. A gauze plug is inserted for the hæmorrhage. Several successful cases are reported.

Fig. 100.—Patient before operation.

Fig. 101.—Patient after operation. Drawn from an untouched photograph.

Nasal Deformities.—For cases in which a large part of the bony frame-work of the nose has been destroyed, Carter[12] transplants a piece of rib properly shaped directly against the side of the defect, the soft parts in the periosteum overlying the bone being first separated so as to admit of its introduction. The piece is taken from the middle of the ninth rib, where the muscular covering is very thin. The patient is caused no inconvenience, and the resected portion is quickly reconstructed from the periosteum. When the bone is split and the cancellous tissue removed, the strips of compact bone can easily be shaped to suit the deformity and, if the occasion demands, several layers can be superimposed. It is necessary to remove the cancellous tissue, as this does not add to the vitality of the graft (*Figs.* 100, 101).

The detailed technique is as follows: The skin over the nose and over the ninth rib on the right side is prepared for an aseptic operation; a short transverse incision is made down to the bone at the nasofrontal suture. Through this incision the skin and subcutaneous tissues over the dorsum of the nose are elevated with a long, thin, two-edged knife, curved on the flat. Above this incision the tissues, including the periosteum, are elevated for about three-eighths of an inch. This wound is covered with sterile gauze. The ninth rib at about its middle is then exposed for two inches, shelled out of the periosteum, and removed. "I then split this section of rib in its transverse diameter, scrape off its medullary portion, and shape one of the strips of bone to suit the deformity. This is then inserted into the wound in the nose previously made for its reception, care being taken to insert the upper end under the periosteum over the nasofrontal process. Both wounds are then irrigated with sterile salt solution, closed with silk sutures, and sterile dressings applied. The dressings are changed for the first time on the seventh day, and the sutures removed two days later."

Hildebrand[13] has devised an ingenious plastic operation for restoring the septum when destroyed as a result of syphilis. He makes an osteoplastic flap in the forehead by forming a T-shaped flap from the root of the nose. The centre portion of the T is resected with a layer of bone. The two edges are then folded back in such a way as to enclose the bone completely in skin. An incision is made at the root of the nose, and the flap turned in and drawn down, so that the skin-enclosed bony flap forms the new septum. Freshening of the edges is done when needed, and the denuded portions on the face united as is usual in such operations.

Submucous Resection of Septum.—This operation is standing the test of time, and with increasing experience and better technique the number of perforations is steadily lessening. While minor variations exist, the essential technique of all operators is the same.

Purcell[14] regards the initial incision as the key to the operation. Beginning well up on the septum with the ala nasi lifted, a vertical incision is carried down to and about half across the nasal floor. This incision has to be made, or at least finished, with an angular knife. From the lower end of this, a slightly curved incision in a horizontal direction is brought forward more in the cutaneous than in the mucocutaneous structure. This acute angle flap, when elevated, gives easy access to the crista. He has had one perforation in 126 cases.

Emerson has looked up the end results in forty-two cases: all but two had free nasal breathing; one of these was partially relieved, the other not at all. Thirty-nine had no trouble since the operation, and found their general health improved. In three cases of perforation, only one was noticed by the patient. The operation is adapted only to the specialist accustomed to the surgery of the interior of the nose, and should not be attempted by the unskilled in this field.

To prevent perforation at the site of the original incision, Nelson[15]

makes the cut through the cartilage from $\frac{1}{8}$ in. to $\frac{1}{4}$ in. posterior to the point of initial incision through the mucous membrane.

For removing the bony portion of the deviated septum and to avoid breaking more of the bone than is desired, Glogau[16] has designed a submucous saw with parallel blades facing and fitting into one another, which are used in much the same manner as the submucous knife after the mucoperichondrium is properly elevated on each side. Another model, made to saw vertically, may be used for the posterior margin. The saw portion is about an inch in length.

Rosenheim[17] describes his technique, which does not differ essentially from that in general use. He obtains his anæsthesia with pledgets of cotton dipped first in 1–1000 adrenalin chloride, then in powdered cocaine, and rubbed on both sides of the septum and any other portion on which it is desired to operate.

After all the bone and cartilage that is necessary has been removed, the septum will assume a vertical position. Both sides of the septum are packed (Prof. Killian and many other operators no longer use a tampon after the operation, not finding it necessary) with guttapercha protectively smeared with vaseline and removed on the side opposite the incision in twenty-four hours, and on the same side in forty-eight hours. He does not advocate the operation in young children. Depression in the bridge only occurs when cartilage has been too extensively removed. The septum gains firmness but does not regenerate.

Faulder[18] reports a case where a second submucous resection was done. Where the cartilage had previously been removed, the two layers of mucoperichondrium were in contact, and there was entire absence of any regenerated cartilage, bone, or fibrous tissue.

REFERENCES.—[1]*Brit. Med. Jour.* 1910, Nov. 26; [2]*Jour. Laryngol.* 1911, Ap.; [3]*Brit. Jour. Child. Dis.* 1911, June; [4]*Deut. med. Woch.* 1910, Oct. 6; [5]*Lancet*, 1911, June 10; [6]*Deut. med. Woch.* 1910, Dec. 8; [7]*Laryngol.* 1911, 348; [8]*Sem. Méd.* 1910, Aug. 17; [9]*Berl. klin. Woch.* 1911, Jan. 23; [10]*Lancet*, 1910, Oct. 1; [11]*Ibid.* Oct. 29; [12]*Jour. Amer. Med. Assoc.* 1911, Ap. 29; [13]*Berl. klin. Woch.* 1911, July 24; [14]*Jour. Amer. Med. Assoc.* 1910, Oct. 22; [15]*Ibid.* 1910, Nov. 19; [16]*Amer. Med.* 1910, Dec.; [17]*Johns Hop. Hosp. Bull.* 1911, Ap.; [18]*Brit. Med. Jour.* 1910, *Oct.* 29.

OCULAR MUSCLES, AFFECTIONS OF. *A. Hugh Thompson, M.D.*

At the 1910 meeting of the British Medical Association[1] the question was raised whether the paralysis of an ocular muscle in an adult is necessarily a sign of serious disease of the nervous system—syphilis, tabes, disseminated sclerosis, or tumour—or whether cases occur the significance of which is comparatively trivial. Bishop Harman contended that there are many cases of single muscle paralysis similar to Bell's paralysis and due to extreme cold. He had seen many such, in which cure was established in three weeks under no treatment beyond **Strychnine.** Although some members were sceptical, the general opinion was that these cases do occur. It would be well, however, to give a guarded prognosis at first, as if the condition does not clear up in a few weeks it is probably indicative of something

serious. There is also the possibility of recurrence to be considered, in which case the prognosis is correspondingly grave, but that isolated cases of minor import do occur may be considered proved, as some have been watched for twenty years after the original attack without either recurrence or grave sequelæ. On the other hand, cases of transient diplopia occur which are made light of at the time, in patients who are apparently free from syphilis or any other disease of the nervous system, but who, if watched for some years, develop symptoms of disseminated sclerosis.

Polio-encephalitis is a disease analogous to anterior poliomyelitis (infantile paralysis), the latter affecting the grey matter of the cord, and the former that of the brain. The symptoms of polio-encephalitis depend entirely on the region of the grey matter involved. Stephenson[2] describes an oculo-motor type of polio-encephalitis, in three-fourths of which the external rectus of one eye alone is affected, so that on casual examination these cases are very apt to be diagnosed as ordinary convergent strabismus. They often follow some zymotic disease, and occur at an earlier age than concomitant squint, half of Stephenson's cases having begun under the age of twelve months. Neither of these points, however, is pathognomonic, and the decision as to whether there is or is not a paralytic element in the squint of a young child is often very difficult. The best way is to test for secondary deviation by means of the corneal reflex. In cases where any other muscle than the external rectus is affected, the diagnosis of paralytic strabismus is comparatively easy, but even here the cause may be in doubt.

REFERENCES.—[1]*Brit. Med. Jour.* 1910, Oct. 29; [2]*Ophthalmoscope*, 1911, 164.

ONCHOCERCIASIS. *Leonard Rogers, M.D., F.R.C.P.*

R. T. Leiper[1] describes the appearances of *onchocerciasis* occurring in the cattle and producing changes in Australian and other beef, including that from the United States. The parasite belongs to a group of worms which have to pass through a stage of development in a biting insect before they can be transmitted to another warm-blooded animal. As they do not survive the death of their animal hosts by more than a few hours, the direct infection of man by eating such meat is impossible.

REFERENCE.—[1]*Jour. Trop. Med. and Hyg.* 1911, Mar. 15.

OPTIC NEURITIS. (*See also* NASAL ACCESSORY SINUSES.)

ORAL SEPSIS.

Mercury Colloid a useful mouth wash (*page* 25).

ORBIT. *A. Hugh Thompson, M.D.*

Acute Orbital Cellulitis (Hosford[1]) may be due to: (1) Blood states; (2) Metastatic inflammation; (3) Trauma; and (4) Inflammation spreading from contiguous cavities. The cavities from which inflammation usually spreads are those touching the inner wall of the orbit,

which in the living subject is as thin as note-paper. This accounts for more than half of the cases of orbital cellulitis. It may, however, arise from an abscess of the maxillary antrum. The cardinal symptoms are two, proptosis and œdema. Pain and fever are proportionate to the severity of the attack. In diagnosis the following points are to be borne in mind. Acute purulent conjunctivitis may resemble it so far as the pain, swelling, and chemosis go; but in this disease proptosis does not occur except, perhaps, to some slight extent in very severe cases, owing to the pressure of collections of pus in the conjunctival folds. The lacrymal gland must also be remembered. Hosford mentions the case of a tuberculous child who developed acute dacryo-adenitis with intense swelling of the lids, which subsided in a week, leaving the gland chronically enlarged, palpable, and riddled with pus. Another rare affection that may simulate orbital cellulitis is metastatic panophthalmitis occurring without any local injury, in puerperal infection or pyæmia. The presence of intra-ocular signs, such as purulent iritis with early and total loss of sight, would be present in such cases. Again, orbital cellulitis may exist as a result of a more serious condition, namely thrombosis of the cavernous sinus. This is "sudden in onset, not very painful, if at all, in the early stages; œdema of the forehead and over and about the mastoid is nearly always present." If it is possible to separate the lids sufficiently to use the ophthalmoscope, cases of sinus thrombosis will very probably show hæmorrhages and œdema of the retina, with reduction of vision or even blindness, while in simple cellulitis the fundi are normal until a late stage of the disease. Having excluded these conditions, the most essential point in diagnosis is to procure a proper examination of the nasal cavities and antrum. If there is pus beneath the middle or superior turbinated bone, there is almost certainly ethmoidal disease; if there is none, it does not exclude it, and a thorough examination of the sinuses, if possible, should still be made. In ethmoidal disease the displacement of the eyeball due to cellulitis, besides being forward, will be *down and out*. In antral disease it will be *up and in*.

Treatment.—Early and free **Incision** is essential. In searching for the pus we must be careful not to injure the tendon of the levator palpebræ or of the superior oblique, the optic nerve, ciliary ganglion, or the ophthalmic veins. Unless pus is actually pointing, it is safer to make an exploratory incision from the outer side.

Prognosis.—In cases of simple orbital cellulitis treated efficiently, the outlook is good. Septic thrombosis of the cavernous sinus is practically always fatal; but non-septic monolateral cases very frequently recover. Hosford has notes of fourteen such cases.

Reference.—[1]*Lancet*, 1911, Jan. 21.

OS CALCIS, EXOSTOSES OF. *Priestley Leech, M.D., F.R.C.S.*

Davidson[1] reports 10 cases of this condition. The causes are: (1) Direct infection, gonorrhœa being the most frequent; (2) Direct trauma, callus being thrown out following injury and this becoming

organized; (3) Static cases, associated with weak and flat feet. Radiography is of inestimable value in confirming the *diagnosis*, as the osteophytes can rarely be felt through the skin.

Treatment.—It is best to remove the exostosis or osteophyte by the chisel. In cases where operation is either refused or thought inadvisable, relief can be obtained by a cushioned heel, as recommended by Bradford. A short inner sole of thick leather is fitted to the shoe, and to the under surface is attached a pad of sponge rubber sufficient in size to cover the striking area of the heel. This is cut out in such a way as to leave a hole opposite the region where the spur may be supposed to exist.

Reference.—[1]*Therap. Gaz.* 1911, Ap. 15.

OXALURIA.

(*Vol.* 1909, *p.* 616)—The **Diet** should consist of milk, meat, eggs, butter, and rice. **Magnesia** and **Potassium Citrate** are the most useful drugs.

OZÆNA. (*See* Nose, Diseases of.)

(*Vol.* 1910, *p.* 51)—Trautmann advises the local application of **Pyocyanase.**

PANCREAS, SURGERY OF. *J. B. Deaver, M.D., LL.D., D. B. Pfeiffer, A.B., M.D.* } *Philadelphia.*

Etiology.—Arnsperger[1] draws attention to the *rôle* played by the lymphatics in conducting inflammation from the region of the gall-bladder to the head of the pancreas. While this is not a new idea, it has not been sufficiently emphasized, attention having been focused chiefly upon the transference of infection from the biliary tract along the course of the common bile-duct itself through the medium of the infected bile. Infection of the head of the pancreas by contiguity may undoubtedly occur from the common duct, since its terminal portion passes through a channel in the pancreatic substance in about two-thirds of all cases, while in the remainder it grooves the head of the gland. Likewise it has been conclusively shown that the bile may readily be retrojected into the pancreatic duct by reason of the fact that both the choledochus and the pancreatic duct empty into a common chamber, the sinus of Vater, before discharging their mixed secretion into the duodenum. The much-quoted and spectacular case of Opie, in which a stone was impacted in the ampulla, thus making a closed system of canals of the biliary and pancreatic tract in which the secretory pressure of the liver overpowered that of the pancreas, causing a flow of bile into the pancreas and fatal hæmorrhagic pancreatitis, has attracted more attention to this method of infection than its numerical importance probably deserves. Thus we find Mayo ascribing the frequency of pancreatic disease to what he calls the "unfortunate association of terminal facilities" of the biliary and pancreatic system of ducts. We now know that the pancreas is affected in conjunction with inflammation of the gall-bladder in a large percentage of cases. It is impossible in the vast majority of these cases to demonstrate anything like obstruction of the ampulla of Vater.

Moreover, the pancreas is affected at least almost as often when the gall-bladder does not contain stones as when they are present. Thus in a recent series of 73 cases of pancreatitis which I collected from my own practice, chronic pancreatitis was found 35 times with simple cholecystitis, as against 38 times with cholelithiasis. This argues against intermittent obstruction of the ampulla by a foreign body as a cause that is chiefly operative in the production of pancreatitis. Unless, then, we assume a catarrhal inflammation creeping along the mucosa from the biliary to the pancreatic ducts, it is clear that the "association of terminal facilities" has less to recommend it as a cause of pancreatitis than has been supposed. The question is somewhat analogous to that of the method of ascending infection of the kidneys, which now we are inclined to believe takes place by way of the lymphatics rather than by inflammatory agents creeping upwards along the surface or stemming the current of excretion. Arnsperger points out that long ago Sappey demonstrated the existence of lymphatic communication between the gall-bladder region and the head of the pancreas, and his work has been confirmed more recently by Franke and others. These lymph channels run along the course of the common duct, many being intercepted by lymph glands, but some proceeding directly without such intervention. About the head of the pancreas are many small aggregations of lymphatic tissue, the lymphoglandulæ pancreaticæ. Into these drain the lymphatics of the head of the pancreas, which run in the interlobular septa. This furnishes the course by which inflammation is readily transmitted from gall-bladder to pancreas. In the early stages, the pancreatic affection resulting therefrom is not a pancreatitis as ordinarily conceived, but a lymphangitis pancreatica, in which the swelling is due to œdema and perhaps to cellular infiltration. This corresponds to the observations made as to the disappearance of pancreatic swelling after removal of the gall-bladder or subsidence of its infection, since the fluid and cellular exudates are readily absorbed, while the same is not true of a deposit of organized fibrous tissue.

Treatment.—This conception has an important bearing on the question of the treatment of gall-bladder disease where pancreatitis is a complication. Is cholecystostomy with temporary bile drainage a satisfactory operation in this condition from the standpoint of end results, or should a more radical operation be done, either cholecystenterostomy to provide for permanent internal biliary drainage, or removal of the gall-bladder to get rid of the source of infection to the pancreas? Le Grand Guerry[2] recites a rather unusual experience in this connection. He had had in all 15 cases of chronic pancreatitis. Out of these cases, the first 12 were treated by cholecystostomy, with the result that nine out of the 12 returned for a second operation, made necessary by a recurrence of the symptoms, at which time cholecystenterostomy was done. He has heard recently from eight of the nine patients, and they all report the general health and strength as being in every way satisfactory. Of the nine patients re-operated, in

only one was the pancreatitis associated with gall-stone disease. In the last three cases he felt justified in making permanent drainage at the primary operation, with the result that the trouble was ended at once. In this series one patient died of ether pneumonia. There is of course no question that when the pancreatitis has caused cicatricial stenosis of the common duct, a cholecystenterostomy should be done. It seems, however, that we must widen our indications for this operation, and include many cases which show marked pancreatitis without extensive gall-bladder disease, or those cases of pancreatitis clearly consequent upon a diseased gall-bladder when the condition of that organ is such as to make it doubtful whether temporary drainage will succeed in restoring it to a state of health. As cholecystenterostomy is an operation of slightly greater magnitude and higher mortality than simply cholecystostomy, it is necessary to apply this rule with caution in the individual case, for it cannot be questioned that many cases of associated pancreatitis and gall-bladder disease are entirely relieved by cholecystostomy alone.

Chronic Pancreatitis.—From a study of 38 cases uncomplicated by cholelithiasis which occurred in his own practice, Deaver[3] has endeavoured to construct a *clinical picture* of the disease. Unlike many other conditions, it seems impossible, at present at least, to outline in a few words the salient features of this disease, so great is the variability with which the various symptoms are found. "There are no pathognomonic symptoms, no short cuts to the diagnosis of chronic pancreatitis: it is to be made only by the solution of an equation, the factors of which are obtained by three separate lines of inquiry, viz., (1) Anamnesis; (2) Physical examination; (3) Special tests designed to show disturbances of pancreatic function."

The pain of chronic pancreatitis or its mild exacerbations is not in itself characteristic. It varies from dull discomfort or ache to sharp lancinating or colicky pain quite like gall-stone colic. It may be merely a sense of fullness or distress in the epigastrium. In the majority of cases, when the pain was colicky the gall-bladder was diseased also. As a rule the pain is in the epigastrium, but may be in the right or left hypochondriac or in the lumbar region. Relation to food is very indefinite. Nausea and vomiting during the exacerbations which commonly occur in the course of chronic pancreatitis, are but slightly less common than pain. Jaundice also is frequently seen. These constitute the cardinal symptoms, and when linked with signs of deficient pancreatic secretion, as shown by the fæces, the diagnosis may be made presumptively. The physical examination is not of great importance, though occasionally the existence of definite tenderness over the head of the pancreas is helpful, especially if that organ is enlarged and palpable, which is unusual. Deaver's experience with the Cammidge "C" reaction, comprising 351 cases in which it was used, has been unsatisfactory. (*See also* URINE.) "Of 19 cases in which the test was made in the present series, it was positive in 4 and negative in 15. This is a scarcely higher percentage of positives than we

obtained in 60 cases in which the pancreas appeared normal to direct palpation at the time of operation. Ten of these 60 cases gave a positive Cammidge reaction. One-fifth positive in pancreatitis, as compared with one-sixth positive when no pancreatitis existed, does not inspire faith in the reaction." Constipation is found as a rule. Diarrhœa and the classical "frequent bulky motions, pale in colour, offensive, and obviously greasy" are uncommon save in very advanced conditions. Even when not typical, however, careful microscopical and chemical examination of the stools may prove suggestive of the inefficiency of pancreatic digestion. The other laboratory aids are discussed, and considered *sub judice* for the present.

Acute Pancreatitis.—The case histories of 21 cases of acute pancreatitis from the Massachusetts General and Faulkner Hospitals of Boston, are reported by Balch and Smith.[4] From a study of these it is considered that almost all the acute diseases of the pancreas begin as an acute hæmorrhagic inflammation, accompanied usually by free fluid in the peritoneal cavity and by disseminated fat necrosis. **Operation** is the treatment indicated, unless the patient is in such severe collapse that the additional shock would surely be fatal. The object is to drain the pancreatic secretion and the products of infection; this is best done by incising the tissue of the gland, as advised by Porter, and by carrying the drainage through the gastro-hepatic omentum close above the lesser curvature of the stomach. They add another case of this disease due to impaction of a stone in the ampulla of Vater. In this case also the mucosa of the pancreatic duct was found to be coated with greenish-tinged mucus, evidently due to the bile which had been forced into the duct. In another case, the orifice of the ampulla was occluded by an inspissated plug of mucus. In a third, the common duct was dilated to the size of a little finger, and in the duodenum, apparently just passed, lay a gall-stone the size of a hickory nut. In the entire series six had gall-stones and three more showed evidence of biliary disease.

Barker's[5] case of acute pancreatitis recovered after two operations, gauze drainage being introduced to the head of the pancreas at the first. At the second operation a purulent collection in the lesser peritoneal cavity was opened through the left loin, an incision to which Deaver has directed attention as of general use in the drainage of pancreatic collections. This case is of especial interest, since operation seven months later to relieve obstruction due to pelvic adhesions, gave an opportunity again to palpate the pancreas. Nothing abnormal to the touch was found except that the organ appeared smaller than normal.

Chronic Calculous Pancreatitis.—A novel operation was carried out by Link.[6] The patient was a woman, twenty-two years of age, who had suffered practically all her life from periods of indigestion and vomiting. Several months after an unusually severe attack which caused marked loss of weight and strength, anæmia, and pain and tenderness on the left side under the ribs, she came to operation.

The incision was made in the left loin under the idea that the left kidney was at fault. This was, however, found normal, but the tail of the pancreas was recognized as a peculiar pointed object which felt like a bag of sand. This organ was therefore exposed anteriorly through the mesocolon. It was symmetrically enlarged, and gave the same sensation to the touch over its entire extent, as a bag filled with sand. Link decided to explore the main pancreatic duct, and, since the stony deposits in the parenchyma could not be removed, to attempt direct drainage.

"In order to accomplish this successfully, it seemed necessary to have a channel of pancreatic tissue leading out of the abdomen for carrying the gland secretion. Tearing through the posterior wall of the lesser cavity, I seized the tail of the pancreas, and making gentle traction, began to enucleate it just as if it were a pyosalpinx covered with adhesions. It was a comparatively easy task to free the pancreas until the superior mesenteric artery was reached. As this enabled me to bring the tail out of the abdominal cavity easily (*Plate XXIX, Fig. A*). I did not attempt to disturb it further. Sponges were placed in its bed to arrest hæmorrhage, which was not at all alarming; the pancreatic branches of the splenic artery were not ligatured. I then split the pancreas in the middle line along about two-thirds of its length, after having protected the operative field with sponges. This opened the dilated duct of Wirsung, which was found to be filled with small faceted stones along its entire length. The stones, excepting those in the head of the gland, were removed. A small portion was excised from the middle of the gland for microscopic study.

"A drainage tube made from a portion of a 16 F. red soft-rubber catheter was laid in the duct of Wirsung and allowed to extend beyond the tail of the pancreas for several inches. The gland was then closed around it carefully with a continuous suture of No. 1 chromic catgut (*Fig. B*). Each suture included a fair amount of gland tissue. No effort was made to close the edges of the duct separately. No deep buried stitches were placed in the pancreas. In sewing the gland, care was exercised to have the continuity of the outer surface accurate; points of imperfect coaptation were reinforced by single stitches. In places where the duct was not large enough to include the drainage tube, the gland substance was united over the tube.

"The opening in the mesocolon was carefully closed and stitched to the pancreas to prevent hernia into the lesser peritoneal cavity. The great omentum was used to cover the suture line in the pancreas above, being folded under the colon parallel with the mesocolon (*Fig. C*). A gauze drain was placed below the pancreas to separate it from the small intestines; this drain was brought out of the wound. The abdominal wound was then closed. The pancreas was brought out of the lower angle of the incision and stitched to the deep muscular aponeurosis to keep it from withdrawing into the abdomen before becoming adherent. There projected at least half an inch of pancreas beyond the skin, and out of the summit of the pancreatic tissue the

PLATE XXIX.

LINK'S OPERATION FOR CHRONIC CALCULOUS PANCREATITIS

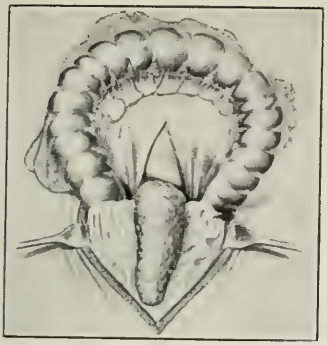

Fig. A. Pancreas brought through opening in mesocolon. The stomach is seen just above the pancreas.

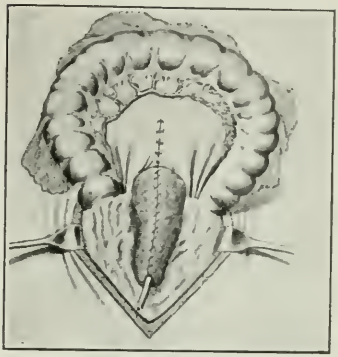

Fig. B.—Pancreas with drainage tube inserted. Incisions in pancreas and mesocolon closed.

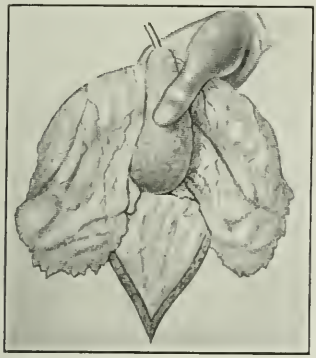

Fig. C.—Omentum placed to cover suture line in pancreas.

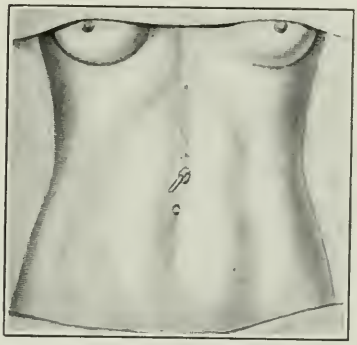

Fig. D.—Tail of pancreas. Drainage tube projecting from healed wound.

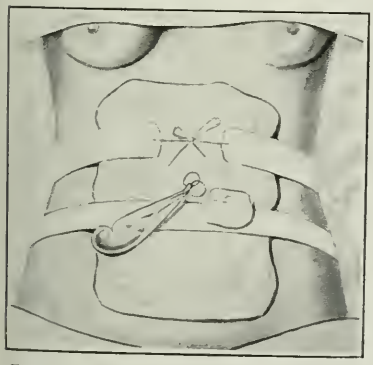

Fig. E.—Method of dressing and collecting the drainage. The drainage sac is carried in pouch when patient is standing.

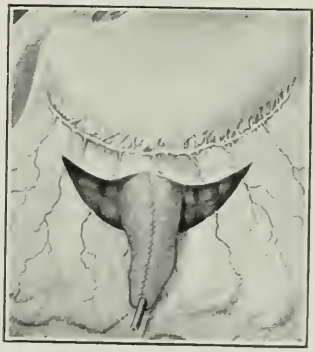

Fig. F.—Illustrates the pancreas brought between colon and stomach instead of through mesocolon.

By permission from "Annals of Surgery.

drainage tube extended (*Fig. D*). An ordinary rubber condom was tied over the end of the drainage tube.

"Pancreatic fluid began to flow from the drainage tube at once. This was collected and measured. The largest amount passed in twenty-four hours was 25 oz. and 6 dr. The usual amount for the first two weeks was 24 oz. in twenty-four hours. After two weeks, this amount had become reduced to 18 oz. At the end of the third week it was 6 oz. in twenty-four hours. This decrease was not due to a decrease in the secretion, but to the fact that as the pancreatitis subsided and the swelling of the gland became reduced, a greater portion was allowed to escape by the normal way. At the present time, drainage is from 2 to 8 oz. in twenty-four hours, according to circumstances. The tube was protruded through a cotton-filled pad, and no fluid reached the skin; except once or twice when a poorly tied tape allowed escape of fluid from the container, the skin has not been excoriated. This method of collecting fluid in a condom (*Fig. E*) is excellent to prevent soiling the skin. It was originated by Dr. G. J. Cook, of Indianapolis, for collecting bile after cholecystostomy. The patient, who is a very intelligent lady, lives 200 miles away in a neighbouring State, and cares for the drainage herself.

"Within three months after the operation she had gained 20 lb.; at the present time she weighs 148 lb. Her old attacks have never recurred. She is able to ride horseback and to enjoy all the pleasures of life. She states that her health is better than at any time for several years. By an artful arrangement of her clothing, and by having the drainage tube very short, she dresses and mingles socially among those who know nothing of her affection."

The pathological diagnosis was multiple calculi of the pancreatic ducts and chronic interstitial pancreatitis, chiefly of the interlobular type. The islands of Langerhans being preserved, as shown in the figure, no glycosuria was present. The successful outcome of this operation marks it as a brilliant solution of the problem of treatment of an affection which, while infrequent, could hardly be relieved in any other manner.

Cysts.—Taking an interesting case of multilocular cysto-adenoma of the pancreas as a text, Körte[7] discusses the question of cysts and pseudo-cysts of the pancreas, and points the difference necessary in treatment by personal instance. The case of cysto-adenoma had been operated on twice previously for the same condition, and the presenting cyst marsupialized. He was able to dissect away from the body of the pancreas a multilocular cyst, the cavities of which were lined by epithelium which defeated cure by drainage. Cysts which are the result of hæmorrhage or inflammation, on the contrary are readily cured in this way, since the walls granulate and cohere after evacuation.

Tumours.—Sherren[8] adds an additional case to the few recorded instances of removal of a solid tumour of the pancreas other than carcinoma. The tumour was a round-celled sarcoma, encapsulated

and readily enucleated, the patient making a good recovery. The diagnosis in this case was not suspected, on account of the mobility of the growth, which could be easily moved about beneath the abdominal wall. For this the general teaching is at fault. It must be recognized that the pancreas is movable and that tumours of the organ are often very mobile unless fixed by inflammatory or malignant adhesions.

References.—[1]*Münch. med. Woch.* 1911, Ap. 4; [2]*Jour. Amer. Med. Assoc.* 1910, Dec. 31; [3]*Ibid.* 1911, ii., 1079; [4]*Bost. Med. and Surg. Jour.* 1910, ii, 384; [5]*Lancet* 1910, ii, 1264; [6]*Ann. Surg.* 1911, i, 768; [7]*Med. Press*, 1911, i, 512; [8]*Lancet*, 1911, June 3.

PANNUS.

(*Vol.* 1909, *p.* 265)—**Römer's Jequiritol** should be used in all four strengths successively, from the weakest upwards, until an inflammatory reaction of the desired degree is attained. If this reaction gets out of hand, it can be checked by the specific anti-serum also prepared by Römer.

PARALYSIS AGITANS.

Purves Stewart, M.D., F.R.C.P.

Treatment.—This has hitherto been somewhat disappointing. Innumerable drugs have been tried, of which almost the only really useful one has been **Hyoscine** or one of its allies, by means of which a certain amount of alleviation to the stiffness and cramps has been obtained. The treatment, however, has necessarily been purely symptomatic, in the absence of adequate knowledge as to the true pathology of the disease.

For some time past it has been well known that excision of the parathyroid glands experimentally in dogs has produced various spasmodic symptoms closely resembling those of tetany. This suggests that the internal secretion of these glands has an important action upon the nervous system. Tetany has also followed removal of the parathyroid glands when they have been included with the thyroid in operations for goitre. Certain observers, such as Lundborg[1] and Berkeley,[2] have suggested that tetany is not the only disease associated with parathyroid deficiency, but that paralysis agitans is possibly due to some chronic disorder or disease of these bodies. In support of this hypothesis, Berkeley[3] has offered the following considerations:— Paralysis agitans presents many of the features of chronic toxæmia. The symptoms following parathyroidectomy are not unlike those of paralysis agitans. In cases of myxœdema and exophthalmic goitre paralysis agitans has occasionally been noticed as a complication or sequela. Several cases of autopsy on paralysis agitans by Camp[4] and by Berkeley[5] have shown pathological changes in the parathyroid glands, although others recorded by Erdheim[6] and by Thompson[7] have failed to reveal any abnormality. Lastly, and perhaps most important, a certain percentage of cases of paralysis agitans, treated by administration of **Parathyroid Gland**, have been considerably benefited. The method of treatment employed by Berkeley is by means of the administration of the nucleoproteid, extracted, according to Beebe's method, with special rapidity in the early stages, the precipitated nucleoproteid not being redissolved, but quickly dried in the

air, mixed with lactose, and dispensed in capsules containing about gr. $\frac{1}{50}$ of the nucleoproteid. The average dose is two capsules per diem. Berkeley has treated over sixty cases, and claims that between 60 and 65 per cent of those who have given the remedy a fair trial speak favourably of it. In some cases the patient complains of restlessness, and of an increased tendency to constipation at the start of the treatment. In such cases the dose should be diminished, and afterwards slowly increased again. Little benefit can be expected unless treatment is prolonged for several months at least. The drug is at present somewhat expensive, and it is too soon to form a definite judgment as to whether its action is likely to be as specific as that of thyroid medication in myxœdema.

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PARATYPHOID FEVER. *E. W. Goodall, M.D.*

ETIOLOGY.—An instructive discussion took place at a meeting of the epidemiological section of the Royal Society of Medicine, following a paper by F. A. Bainbridge[1] on the etiology and epidemiology of paratyphoid fever and "food-poisoning." Bainbridge begins his paper by setting forth the bacteriological differences between the four organisms, *B. suipestifer* (or Aertryck), *B. paratyphosus B*, *B. enteritidis* (Gaertner) and *B. paratyphosus A*. He states that "*B. paratyphosus A* can be readily identified by cultural methods and by agglutination tests with a suitable serum. The other three organisms are identical in their cultural characters, but *B. enteritidis* (Gaertner) can be differentiated from *B. suipestifer* and *B. paratyphosus B* by agglutination tests. Finally, *B. suipestifer* and *B. paratyphosus B*, which are usually indistinguishable by the agglutination method, can be differentiated from one another by means of the absorption method introduced by Castellani." He points out that many German writers do not use the absorption method, and therefore regard *B. paratyphosus B* and *B. suipestifer* as identical. (1) *B. paratyphosus A* has never been isolated in this country. It is rare in Germany and America, but is not uncommon in India. Clinically, the vast majority of the cases due to this organism resemble mild enteric fever, though it has been found in cases of acute enteritis. With one exception it has not been found in healthy men, in the lower animals, or in food or water. (2) *B. paratyphosus B* is confined to man. It usually causes an illness which is very much like enteric fever, but may give rise to acute gastro-enteritis. In this country, *B. paratyphosus B* has been found, with rare exceptions, only in cases of human paratyphoid fever. In outbreaks of fever due to this organism, the infection is probably derived from a human carrier. (3) *B. suipestifer* has in this country very rarely been found in man apart from outbreaks of "food-poisoning"; it was found in a few cases in an outbreak of summer diarrhœa. From their own observations, Bainbridge and O'Brien are disposed to believe

that its usual habitat is the alimentary canal of pigs and other lower animals, and food derived from such animals. Swine fever is caused by a filter passer, and the *B. suipestifer* is merely a secondary invader in this disease. It is therefore doubtful whether, in cases of food-poisoning in the human subject, the *B. suipestifer* is the cause of the disease, or a secondary invader. (4) *B. enteritidis* (Gaertner), apart from food-poisoning, is of rare occurrence, not only in animals but in man; but it is undoubtedly the cause of outbreaks of "food-poisoning," and is present in the persons attacked and in the food (meat) which is the cause of the outbreak. But how it gets into the meat, or the animals which are the source of the meat, is not clear.

Firth[2] and Grattan and Wood[3] in recent papers discuss the question of paratyphoid fever in India. Cases of paratyphoid fever occurring in the United Kingdom are stated by bacteriologists to be due nearly always to *B. paratyphosus B*; and cases due to *B. paratyphosus A* are rare. In India, however, nearly all cases are due to *B. paratyphosus A*, and the cases due to the *B* variety are very uncommon. It is probable that a considerable proportion—estimated by Grattan and Wood as one-third—of the cases returned in India as pyrexia of uncertain origin, are cases of infection with *B. paratyphosus A*. Grattan and Wood give a brief description of paratyphoid fever as it is met with in India, from which it appears that clinically it closely resembles typhoid (enteric) fever. Usually it is a milder disease, but they have met with three fatal cases. In only one was an autopsy made, and in that case the only ulcer present in the intestine had perforated. Relapses are not uncommon. The agglutination test is not to be relied upon in diagnosis. The only sure criterion is the isolation of the specific bacillus from the blood.

Symptoms.—A leading article in the *Medical Record*[4] draws attention to a paper by Botkin of St. Petersburg, and Simnitzki of Kasan,[5] on the *fevers met with during the Russo-Japanese war*. The Russian army surgeons found that while typhoid fever was common, there were a number of cases in which they were at a loss as to whether they should be classified as atypical typhoid or as typhus fever. Later they came to the conclusion that the disease belonged to neither of these categories. Out of 21,849 cases returned as typhoid fever during the war, fully one-third belonged to the group of diseases simulating typhoid; and from this group a distinct disease could be differentiated, to which the name "Manchurian typhoid" was given. Seventy cases of it were observed. According to the writer of the article, the disease is very much like that known as "Brill's disease" (*see also in this volume* Typhus Fever). The first symptoms of "*Manchurian typhoid*" are a sudden onset with rigors and sometimes vomiting; headache and pains in the limbs, a rapid rise of temperature to 102° to 104° F. The temperature remains raised, with slight remissions daily, till the ninth to fifteenth day, when it falls either by crisis or lysis. The rash appears on the

third or fourth day, and is "characteristic, consisting of small, roseola-like and petechial spots that spread over the entire body and become particularly abundant at the flexures of the joints." Bronchitis is frequently present, and there are cerebral symptoms such as are commonly observed in acute febrile diseases.

Simnitzki has isolated from the blood of these cases an organism somewhat resembling the *B. typhosus*. The blood-serum of cases of "Manchurian typhoid" agglutinates these organisms even when it is diluted up to 1–1000 to 5000, whereas it agglutinates the other organisms of the typhoid-paratyphoid group only in dilution up to 1–40. The Japanese, Horiuchi, in post-mortem examinations of two cases, found ulceration in the neighbourhood of the Peyer's patches in the lower part of the small intestine. It seems therefore that "Manchurian typhoid" is rather a disease belonging to the group of typhoid-paratyphoid fevers than typhus.

McNaught,[6] in a very interesting paper on *Paratyphoid Fever in South Africa*, writes as follows on the symptomatology of the disease: "It may at the outset be stated that it is impossible to differentiate paratyphoid from typhoid fever by clinical symptoms." In some cases of an anomalous form of fever which occurred at Wynburg, he describes the rash as consisting of "dark-red spots and blotches, coming out profusely all over the trunk and limbs, including the palms of the hands and soles of the feet. The rash left brownish stains, which, in one case, took several weeks to disappear." In a second group of cases at Pretoria, and a third at Roberts' Heights, he observed a rash having the same characteristics as that just described. In these cases the onset was very sudden, with intense headache and photophobia. The rash appeared on the fifth or sixth day. The temperature curve was similar to that of typhoid fever. In the first outbreak there was pyrexia for two to three weeks, in the second for between one and two weeks. The temperature usually falls by rapid lysis, but occasionally by crisis. Of the Wynberg cases, two suffered from a short relapse with symptoms of cholecystitis.

The blood-serum of these patients does not agglutinate the typhoid bacillus, nor the *B. paratyphosus B* (except very slightly in a few cases). McNaught quotes Lieut.-Col. Maher as informing him that a fever having exactly the same symptoms and with a similar rash is common at Potchefstroom. In discussing the diagnosis, he suggests the disease may be typhus, but he states that it is not contagious like typhus, is not dangerous to life, and does not present the mental symptoms found in typhus. He refers to the disease described by Brill, of New York, of which a brief account was given in last year's *Annual*. (*See* TYPHUS FEVER.)

The cases at Roberts' Heights alluded to by McNaught are described in detail by Statham,[7] especially as regards their bacteriological characteristics. The bacteria isolated from three of these patients presented unusual features, as they markedly fermented saccharose but did not affect dulcite. There were 14 cases examined by Statham.

Although in three only were bacilli recovered from the blood, the serum of all fourteen patients markedly agglutinated these bacilli, but not at all *B. typhosus*, *B. paratyphosus B*, or the two varieties of *B. paratyphosus A*. On the other hand, control tests showed that the bacilli isolated from the three cases were not agglutinated by serum from cases of undoubted typhoid fever, nor by serum from healthy persons. The cultural reactions of the bacilli brought them into the *B. coli* group, according to the definition of the English Committee on Standardization of Water Supplies. Statham says: "From nearly 100 strains of typhoid-colon bacteria, which I have isolated from the blood of typhoid patients in South Africa, nearly one-quarter are atypical. Many of these bacteria cannot be conveniently classed under the terms paratyphoid A or B, with which we are familiar."

In May, 1910, a small outbreak of paratyphoid fever occurred at Manora Camp, about four miles from Naini Tal. The outbreak was investigated and reported by Grattan and Harvey.[8] There were 8 cases altogether; of these 7 occurred amongst the men of the 8th Hussars, and 1 amongst those of the Highland Light Infantry. The first men to be taken ill showed symptoms on May 6th, the last on May 29th. Three others were attacked between May 6th and 11th. *B. paratyphosus A* was recovered from the blood of 7 of the 8 cases, but in 2 cases only from the stools, and in none from the urine. Had it not been for the fact that the *B. paratyphosus A* was recovered from the blood of 7 of the patients, the diagnosis would probably have been typhoid fever. The investigators of the outbreak first examined the serum-reaction of all the men of the 8th Hussars (as the early cases occurred amongst them) with *B. typhosus* and *paratyphosus A*. Practically all showed agglutination with the typhoid, due to previous inoculation, and only one agglutinated with *B. paratyphosus A*. It was discovered that this man had been employed as a cook-orderly in the 8th Hussar cook-house in camp from April 7th to May 11th. It should be mentioned that when the outbreak began the soldiers had been over a month in the camp, so that the infection had been acquired since their arrival.

The man's blood agglutinated *B. paratyphosus A* up to 1–200 dilution; he had been ill in January, 1910, with fever of an irregular type. He also suffered from pain in the hepatic region. He was sent to Manora Camp to convalesce early in April. *B. paratyphosus A* was not discovered in his urine or fæces. The authors consider that this man was the cause of the outbreak, because (1) of his previous febrile attack and his high agglutination reaction; (2) within six weeks of his discharge from hospital he was employed in connection with the food supply of the camp; (3) the first two cases from the camp lived in the same tent with him; (4) he was struck off duty as cook-orderly on May 11th, and the last case of fever occurred on or about May 29th, and there have been no cases subsequently.

A case of *meningitis* due to *B. paratyphosus B* has been recorded by Boonacker and Gorter.[9]

REFERENCES.—[1]*Proc. Roy. Soc. Med.* iv, No. 4, Epid. Sect. 51; [2]*Jour. R.A.M.C.* 1911, Aug.; [3]*Ibid*; [4]*Med. Rec.* 1911, Mar. 25; [5]*Zeits. für klin. Med.* Vol. 22, Nos. 3 & 4; [6]*S. Afric. Med. Rec.* 1910, Dec. 24; [7]*Jour. R.A.M.C.* 1910, Dec.; [8]*Ibid.* 1911, Jan.; [9]*Arch. de Mal. des Enf.* 1911, May (*Brit. Med. Jour.* Epit. 1911, ii, 1.)

PELLAGRA. *Leonard Rogers, M.D., F.R.C.P.*

L. W. Sambon,[1] in a progress report on the investigation of pellagra, records further data in support of his hypothesis that the disease is not connected with the consumption of maize, but may possibly be due to an undiscovered protozoal organism, and suggests sand-flies as the carrier of the infection. His main arguments were summarized in last year's *Medical Annual*. He has not obtained microscopical evidence of the existence of any such parasite.

A. Caccini[2] describes pellagra as seen in Italy, where it is widely prevalent, 50 per cent of the rural population in certain places being pellagrous. He discusses recently advanced theories, but considers them to be at present mere suggestions, and thinks that the view of the relationship of the disease to maize, which was well established by Lombroso, is not to be lightly set on one side, although the precise nature of this relationship is still unknown. He has seen a number of cases in New York, where it has long been sporadic, but recently it has become more widely diffused through the United States in an acute form, relatively frequent among well-to-do Europeans.

Paul V. Anderson and William G. Spiller,[3] of Philadelphia, record two fatal cases of pellagra with post mortems, both from asylums. They found marked degeneration of the nerve cells in the anterior horns of the spinal cord, and diffuse degeneration in the posterior and lateral columns, which he thinks is produced by some toxic or infective substance acting on the central nervous system.

Beverley R. Tucker[4] records an analytical study of fifty-five non-institutional cases of the disease in Richmond, U.S., where he thinks the disease is rapidly increasing, so as to have become a national problem, although certainly very rare before 1907. It never attacks attendants on the sick. It occurs in an acute fulminating and a chronic relapsing form, with recurrences in the spring and autumn, and is usually fatal in two to seven years. The symptoms consist of gastro-intestinal, cutaneous, and nervous and mental groups. The ingestion of maize will not alone cause the disease, the exact etiology being unknown. In the United States probably 50 per cent of cases die in the first two years. **Hexamethylenamin** gave very striking results in five cases, and is worthy of further trial. A lengthy discussion took place on this paper, several speakers considering the disease to have become very serious in the United States. **Arsenic** had been most useful in the treatment.

W. T. Corlett and O. T. Schultz deal with pellagra in Ohio,[5] and give very full details of a case, with an autopsy and illustrations of

the naked-eye and microscopical changes in the skin lesions. The nervous system also shows degenerative changes.

Joseph Collins and Luther Sheldon[6] report a case from New York and review the two main theories of its causation. According to the first it is connected with Indian corn, although there are differences of opinion as to what there is in the corn to produce the disease. The second theory is that pellagra is not related to Indian corn, but to some hypothetical parasite, regarding the nature of which opinions are also much divided. They consider that at present the believers in the Indian corn theory have the best of the argument, and that all recent investigations tend to prove this more clearly. King, of New Orleans, has proved that the sun plays some part in the distribution of the skin lesions, as exposure of other parts of the body to the sun than those usually affected, results in skin affections on the exposed parts. No treatment has proved of much value, except perhaps transfusions (see below). He records a rapidly progressive and fatal case seen in New York, with atrophy and pigmentation of the deeper layers of the cerebral cortex, especially in the frontal region, but without any cord changes.

V. S. Hodson,[7] working in Egypt, has convinced himself that pellagra is no more than a group of skin lesions due to exposure of debilitated persons to sharp winds.

M. V. Carletti[8] has studied the Wassermann reaction in pellagra cases and, contrary to the opinion of some other observers, found that it was negative in every case.

H. P. Cole[9] has **Transfused Blood** from healthy persons, and from those who have recovered from pellagra, into the veins of very advanced pellagra cases, with most promising results. Excluding two moribund patients and two in whom an inadequate amount of blood was given, the mortality was 25 per cent as compared with 40 per cent in the entire series. The blood of healthy persons who were not relations of the patients gave the best results, namely 80 per cent. In the same type of cases treated without transfusion, only 10 to 20 per cent recovered. Experience of the operation is essential to success.

Conflicting opinions as to the value of **Salvarsan** are given on *page* 55.

REFERENCES.—[1]*Jour. of Trop. Med. and Hyg.* 1910, 282, 305, 319; [2]*Med. Rec.* 1911, 421; [3]*Amer. Jour. Med. Sci.* 1911, i, 94; [4]*Jour. Amer. Med. Assoc.* 1911, i, 246; [5]*Jour. of Cutan. Dis.* 1911, 193; [6]*Med. Rec.* 1911, i, 8; [7]*Lancet*, 1910, Oct. 1; [8]*Gaz. deg. Osped.* 1911, 731; [9]*Jour. Amer. Med Assoc.* 1911, i, 584.

PELVIC PAIN IN WOMEN. *Victor Bonney, M.S., M.D., B.Sc., F.R.C.S.*

Victor Bonney,[1] discussing the treatment of abdomino-pelvic pain in women without physical signs of disease, points out that the expression "absence of physical signs" is merely relative. Many of the lesser pathological changes in the pelvis are not detectable by ordinary methods. Thus quite extensive adhesions may exist unknown and undiscoverable except by abdominal section. Many of the women of

the class with which this paper deals are notoriously given to exaggerating the severity of their pains, and nearly always are extremely indefinite in their description of them. He outlines the leading features of the commoner types of pain.

The most frequently met with is that occurring in the *left ilio-pelvic region* with a point of maximum tenderness corresponding to the spot where the ovarico-pelvic ligament reaches the pelvic wall. A similar pain in the right side is also often met with. Both varieties may be due to a neuralgic condition of the ovarian nerves as they travel in the ligament.

Intermenstrual pain is next discussed. The author believes that the pain is due to intermittent tubal distention, the result of salpingitic closure of the abdominal ostium.

Backache is then considered, and it is remarked that while this form of pain is popularly always supposed to be related to the uterus, in practice it is found that it is not a striking symptom in real lesions of the genital tract. Many cases are apparently due to ligamentous or muscular relaxation.

TREATMENT. — In these cases a number of drugs may be tried. **Purgatives** should always be first given a trial. The **Antispasmodics** and **Bromides** are useful. In some cases the so-called uterine sedatives, **Aletris, Viburnum,** and **Bryony,** are of service. In obstinate cases **Counter-irritation** should be employed, especially blistering. **Massage** and **Mechanical Supports** are indicated where much laxity of the parietes exists. The introduction of a pessary in the absence of physical signs is condemned. **Electrotherapeutics** may be tried. They probably act by suggestion.

In the last resort, the question of **Operation** has to be considered. In a general way there is no class of patient in whom it is so desirable to avoid the resort to surgery. The justifying circumstances may be thus stated: (1) Long-continued pain; (2) Resistance to every other treatment; (3) Serious disability; (4) If the patient, fully understanding its problematic chances of success, desires it. The operation is in the first instance exploratory. If adhesions are found, or gross disease, these must of course be rectified. A careful examination of all the abdominal viscera should be made. In cases in which there is nothing discoverable, and in which the pain is believed to be due to "ovarian neuralgia," a portion of the ovarico-pelvic ligament should be resected so as to "anæsthetize" the ovary. This operation was first commended by Gray,[2] and has lately been made the subject of a paper by Harris,[3] who has practised it with success in cases of so-called "ovarian" dysmenorrhœa. The removal of an apparently healthy ovary for chronic pelvic pain is deprecated.

REFERENCES.—[1]*Pract.* 1911, 153; [2]*Brit. Jour. Obst. and Gyn.* 1909, July; [3]*Jour. Amer. Med. Assoc.* 1911, i, 1105.

PEMPHIGUS.

(*Vol.* 1910, *p.* 549)—The principal points are **Asepsis** and **Frequent Warm Bathing** or the affected areas, with **Arsenic** internally.

PENTASTOMUM DENTICULATUM. *Leonard Rogers, M.D., F.R.C.P.*

J. Burton Cleland[1] records the frequency of infection of cattle in New South Wales with a parasite identified as *Pentastomum denticulatum*. The bladder shows villous growths from which hæmaturia occurs. Rarely the parasite has been found accidentally in man in the mesenteric glands, so the frequent infection of cattle may be of some importance.

Reference.—*Austral. Med. Gaz.* 1911, Feb. 20.

PERIADENITIS MUCOSA NECROTICA RECURRENS.

E. Graham Little, M.D., F.R.C.P.

Under this cumbrous title Sutton[1] describes a very singular case of a recurrent localized inflammation of the lingual and buccal mucosa. The patient had suffered from infancy from attacks, repeated about every fortnight, in which small red nodules would develop on the mucous membrane of the mouth and tongue, and slough away, leaving crateriform depressions and finally scars. The temperature and pulse-rate would both rise moderately with each attack. Tuberculosis was suspected, as a von Pirquet reaction was positive, and there was rise of temperature on injection of diagnostic doses of old tuberculin ; but no bacilli were found, and inoculation experiments were negative.

The Treatment adopted was that of tuberculosis in general—**Outdoor Sleeping,** plentiful nourishment, and administration of **Cod-liver Oil, Arsenic,** and **Iron** ; a mouth wash of **Hydrogen Peroxide** and **Vaccines** (**Pneumococcus**) were also used ; on this regimen the patient improved.

Reference.—[1]*Jour. Cutan. Dis.* 1911, 65.

PERICARDITIS. *Carey Coombs, M.D., M.R.C.P.*

Diagnosis.—Wynter[1] calls attention to *loss of diaphragmatic movement* as an early sign of pericarditis. In such circumstances the epigastrium is immobile, or even retracted, and the fixation of the diaphragm may be further demonstrated by skiagraphy. In the discussion it was stated that it was not present in every case, and it was suggested that when it occurs early it may be due to an early involvement of the diaphragmatic portion of the pericardium. [Possibly also to a concomitant subdiaphragmatic peritonitis.—C. C.]. Edwards[2] records a case in point, in which pericarditis was accompanied by abdominal tenderness and rigidity.

Devic and Gardère[3] describe a case of tuberculous pericarditis with a very large area of friction-sound, due, they think, to cardiac hypertrophy, to the prolific exudation of a rough fibrinous type on the posterior surface of the heart, and to free conduction of the sound by the partially solidified left lower lobe. The sound was heard over the greater part of the front of the chest, and also in the back.

Hirtz[4] describes two cases of *pericardial effusion* which support his contention that patients with this disorder assume the knee-elbow position voluntarily to relieve themselves of dyspnœa, and that this

attitude is of diagnostic value. Jacob and Chavigny[5] deduce from their experiences of a case of large serous effusion into the pericardium (which they describe as tuberculous without obvious reason) that it is a very difficult lesion to diagnose. There is no pathognomonic symptom or sign, and even exploratory puncture may yield a misleading result. They regard the *pulsus paradoxus* as the most reliable sign and the *x*-ray findings come next. All other signs they consider quite uncertain.

The diagnosis of *pericardial adhesion* is if anything harder than that of effusion. It must be remembered that the presence of some pericardial adhesion may be inferred in the majority of cases of rheumatic carditis; the difficulty is to discover in what cases pericardial adhesion is doing harm to the effective action of the heart, and to gauge the extent of this harm. One of the signs to which physicians are apt to give especial importance is systolic recession of the left lower thoracic wall posteriorly and laterally, usually known as Broadbent's sign. Unfortunately, not even this is reliable, as is shown by a case recorded by Paterson,[6] in which the sign was present in life; the autopsy discovered a very large heart but no obliteration of the pericardial sac.

TREATMENT.—Jacob and Chavigny[5] advise early **Pericardiotomy** in cases of suspected effusion, even without a preliminary exploratory puncture. They favour resection of the fifth and sixth left costal cartilages close to the sternum, and closure of the wound without provision for drainage.

REFERENCES.—[1]*Clin. Jour.* xxxvii, 318; [2]*Jour. Amer. Med. Assoc.* 1911, i; [3]*Rev. de Méd.* 1911, May; [4]*Nord Méd.* 1911, June 1; [5]*Rev. de Méd.* 1911, 513; [6]*Glasg. Med. Jour.* 1911, ii, 24.

PERICARDIUM, SURGERY OF. *Priestley Leech, M.D., F.R.C.S.*

Mayo Robson[1] describes two cases of removal of sarcomata involving the ribs and sternum with a portion of the anterior wall of the pericardium. He repaired the defect in both cases by sliding a flap of the pectoral muscle (care being taken to stop all hæmorrhage) over the gap left in the anterior wall of the pericardium, and sewing the skin flaps over. Both cases recovered from the operation. One died from recurrence some months later; the second is still living, but with recurrence in the chest wall too extensive for removal.

REFERENCE.—[1]*Brit. Med. Jour.* 1911, ii, 11.

PERITONEUM, SURGERY OF.

John B. Deaver, M.D., LL.D.
D. B. Pfeiffer, A.B. M.D. } *Philadelphia.*

The fervour with which clinicians, particularly the surgeons, have laid bare the source of intra-abdominal infections has, during the past twenty years, established the fact that practically all peritoneal infections are derived from inflammatory disease of the abdominal viscera, and the rôle of the chief offenders, the appendix, the Fallopian

tubes, the gall-bladder, and the pyloric region, has become clear, while a host of less frequent conditions which upon occasion give rise to peritonitis have been recorded, and their mechanism made plain. During this movement the term "idiopathic peritonitis" became absolutely discredited. This attitude was useful in exciting minute inquiry, and has served its purpose. Now, as so often happens, we must return in a measure to former conceptions, for we still find a group of cases, small it is true, and relatively unimportant from the standpoint of treatment, in which, however, not only can no primary intraperitoneal focus of inflammation be found, but the evidence points to primary involvement of the peritoneum, or at least to peritonitis dependent in no way upon the condition of the viscera contained therein.

The term "idiopathic," however, is still not received with favour, and rightly so, because of the implication that such a process may arise *de novo* within the membrane. "Cryptogenic" peritonitis represents more nearly the state of mind in which we find ourselves concerning the origin of certain of these cases, though in a percentage of them our knowledge is approaching definiteness.

Pneumococcal Peritonitis.—A large number of the cryptogenic peritonitides have been demonstrated to be due to infection with the pneumococcus. This affection has a fairly definite clinical picture and pathology, though the last diagnostic resort is of course the bacteriological examination of the exudate. An admirable article upon the subject is contributed by Rischbieth[1] in a paper based upon a study of 57 cases. The term primary is rightly rejected as inaccurate when applied to pneumococcal peritonitis, since this condition though not due to a single focus of disease, such as appendicitis, is yet secondary to a pneumococcus septicæmia. Many cases of pneumococcus peritonitis have not been reported as such because of the multiplicity of the lesions found post mortem, these lesions, however, being due to the pneumococcus, such as pneumonia, pleurisy, pericarditis, arthritis, meningitis, etc. These cases deserve to be considered as pneumococcus peritonitis just as much as those in which the peritoneal lesions play the leading rôle, and our knowledge of the pathology of this condition is considerably helped thereby. The only view which satisfactorily explains these cases is that which ascribes all the pneumococcal lesions, including peritonitis, to a pneumococcus septicæmia. It is known that pneumonia is a septicæmia with special localization in the lungs, just as truly as typhoid is a septicæmia with special lesions in the intestines and elsewhere. Thus pneumonia may be as truly secondary to the bacterial invasion of the blood stream as is the less frequent localization of the infection within the peritoneum or the other serous membranes. The two forms of pneumococcal peritonitis usually described, the local and the general, possess no essential difference as to their pathology, but only a clinical difference, in that the local form represents a process which is less virulent or more vigorously resisted, so that the infection is overcome at all points

except one or more where a purulent collection is found. The condition is far more common in children than in adults, but appears to be more deadly in the latter.

The *clinical picture* is well defined, though differentiation is not easy. The peritonitis sets in abruptly, and is general at once, thus differing from the usual case of peritonitis in which a localization has been apparent at the beginning and only later becomes general by a spread which can be determined if the case is under observation. The symptoms are severe, the temperature is high, and the pulse weak and rapid. The tongue rapidly becomes foul, the breath fetid, and the mouth covered with sordes and showing herpes. Often other lesions are associated, such as meningitis, arthritis, pleurisy, and especially pneumonia, which in many cases precedes the onset of peritonitis by hours or weeks. Headache is common. Dyspnœa and cyanosis are evident in the most severe cases. Nausea and vomiting occur, and occasionally the vomitus is streaked with blood. Diarrhœa is often observed, probably owing to the fact that pneumococcal infections are less toxic for the intestinal musculature, and therefore slower to cause paresis. Bladder symptoms are not uncommon. Abdominal pain is marked and general from the onset. The abdomen is rigid, not distended at first, and generally tender. Death often occurs early from toxæmia. If the patient survives, the usual signs of general peritonitis make their appearance. The abdomen becomes distended, exudate accumulates, the tenderness may become localized at one or more points. The majority of the patients perish in this stage. A few, more fortunate, clear up entirely, while a few others confine the infection to areas where encapsulated collections of pus are formed. These are occasionally spontaneously evacuated, but should have the aid of the surgeon in providing drainage. It has been stated that the collections of pus are prone to form beneath the umbilicus, but it is doubtful if this is true. Certainly they may form at any point within the abdomen. The *character of the exudate* may enable the surgeon to recognize the nature of the case, often without bacteriological examination. The typical pus is greenish, watery, flocculent, and inodorous. Secondary infection will change its character.

Prognosis.—This is bad, as shown by Rischbieth's statistics. Of three cases in adults, all died. Of the 54 cases in children, only six recovered, all recoveries being in cases of the localized form, of which there were nine instances. In the 45 cases of general peritonitis, the mortality was 100 per cent, whether operated or unoperated.

The problem of ameliorating this discouraging mortality is not an easy one. Surgery is unsatisfactory in the general cases, because there are practically always other lesions, and it cannot remove the septicæmia which is the underlying cause. The procedure also is dangerous because of the toxic state of the patients. There is no question, however, that from a practical standpoint, surgery should be advocated, except in the presence of demonstrable coincident lesions, such as pneumonia or meningitis, on account of the difficulty of making

a bacteriological diagnosis of this sort on clinical grounds ; and certain cases which most urgently require operation would be missed by delay, since it cannot be said that operation detracts anything from the slight chance of recovery. In the favourable forms, when localization has occurred, certainly surgical aid should be invoked. The more toxic cases will not be brought to operation in any case if under the care of those who believe in the more recent ideas of treatment of diffuse peritonitis when evidently general and producing profound systemic symptoms. We have something to hope from serum or bacteriotherapy, but not much actual help at the present time.

De Bovis[2] comments upon these cases of pneumococcal peritonitis without intra-abdominal portal of entry, and also notes the existence of a similar condition due to the *streptococcus*. The difficulties of distinguishing these two organisms under certain conditions makes the establishment of this group a matter of close criticism. Eighteen cases were observed during the course of an epidemic of angina at Helsingfors. The outlook of this condition is equally gloomy with that of the pneumococcal variety.

Early v. Deferred Operation in Intermediate Cases.—Perhaps the most important unsettled question in connection with acute intraperitoneal infections is that of the best time for operation in cases which are, as Richardson has expressed it, "too early for a late operation and too late for an early operation." This question comes up oftenest in cases of appendicitis, but it applies as well to other forms of peritonitis which, beginning locally, have, by the loss of the early and favourable moment for operation, proceeded to the stage of progressing or general peritonitis. The appalling mortality of operative treatment in this class of cases, long ago led to marked dissatisfaction with the various methods of treatment, and gave rise to diverse procedures of very radical character, such as evisceration, rough sponging, flushing with bland or antiseptic solutions, complicated systems of drainage, etc. None of these measures proved satisfactory, and gradually, the trend of opinion always being towards simplicity and conservatism, they have been eliminated, with marked improvement in the mortality as a result. Still, however, it remained too high, and the last answer to the question of treatment of these cases is not to operate during this stage. To Ochsner undoubtedly belongs the credit for championing this method, though much harm has been done as a result of misrepresentation of his views. To Murphy we owe the most important practical aid in carrying it out in his method of **Proctoclysis.**

It must be clearly understood that there is no hesitation in regard to the advisability of immediate operation in early cases when the mischief is confined to the appendix or its immediate vicinity. The cases under consideration are those usually of 36 or 48 hours' duration, or longer, of acute symptoms, in whom there is considerable evidence of toxæmia as shown by the appearance and by marked acceleration of the pulse, and usually elevation of the temperature to 101° F. or

higher. The abdomen, instead of presenting only local tenderness, rigidity, and spasm, is diffusely tender and usually more or less generally rigid. The signs in the neighbourhood of the primary lesion are as a rule most marked, but in addition there are the evidences of peritonitis now independent of its origin and producing systemic symptoms. Experience has shown that in the vast majority of cases the peritoneum, if permitted to work under favourable conditions, will take care of the general involvement and confine the mischief to the starting point, when operation can be easily carried out, and at a time when the remainder of the peritoneum has regained its health and has become an ally instead of an enemy. These patients, when they die, do so almost always as a result of peritonitis. Why, then, attack the source after peritonitis has obtained an independent footing, unless it can be shown that our operative measures are curative of peritonitis? That they are not, the former experience of all operators will show. It seems as irrational to insist upon removing the appendix under these conditions as to waste time in trying to extinguish a match which has started a great conflagration. Laparotomy and any form of drainage yet devised will not cure acute diffuse peritonitis. On the contrary, they may serve to cause greater diffusion and absorption of toxins. The capacity of the peritoneum to banish infection is marvellous, and can accomplish the seemingly impossible. Stanton,[3] an ardent disciple of Ochsner, reports 92 patients of this class who were operated upon later, after subsidence of the acute symptoms, with but one death, the fatality being due to the development of Ludwig's angina after all peritoneal symptoms had subsided. He states that he has observed but two cases in which there has been an increase in the peritoneal symptoms after beginning the Ochsner treatment. In both of these cases an exacerbation occurred after injudicious movement of the patients, thus defeating the primary object of the treatment, which is absolute physiological and bodily rest. The line of treatment which has yielded the best results is (1) The exaggerated Fowler position; (2) *Absolute* abstention from anything by the mouth, water and ice included; (3) Continuous enteroclysis after the method of Murphy; (4) Ice bags to the abdomen.

This treatment must be undertaken boldly and carried out rigorously. There should be no haste to operate until the general peritoneum is clear and the signs are entirely local. This will take usually from three to six days, and each case must be considered individually. There is little doubt that this method once adopted will cause a marked diminution in mortality in the treatment of this condition.

Mikulicz's method of *rendering the peritoneum resistant* to surgical infections is lauded by de Paoli,[4] who employs it as a routine method in his laparotomies. In order to avoid the disagreeable symptoms sometimes following nucleinate of soda employed by Mikulicz, he uses **a Salt of Nucleinic Acid**, which is neutral, anhydrous, and perfectly pure. He also gives the dose 36 to 48 hours before operation, in order that the reaction may be complete before

operation. In 155 celiotomies, de Paoli has had only one death from septic peritonitis.

The intraperitoneal injection of **Glycerin** is advised on *page* 16; **Pituitary Extract** to raise blood-pressure on *page* 35.

Ascites.—Treatment by **Drainage** into the subcutaneous tissues of the abdomen is accomplished by Peter Paterson[5] in the following manner. For making the communication between the peritoneal cavity and the subcutaneous tissues, perforated glass buttons are employed (*Fig.* 102).

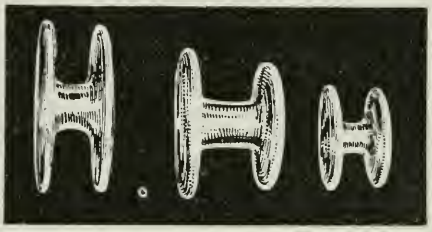

Fig. 102.—Paterson's perforated glass buttons.

An incision is made in the middle line below the umbilicus, and the peritoneal cavity opened. The omentum is drawn down, and amputated well above the point where the drain is to be placed, in order to prevent subsequent occlusion by omental adhesions. The subcutaneous tissues are now dissected outwards to the semilunar line, where a perforation is made into the abdomen to accommodate the button. This is inserted, and the fatty flap is replaced and sewn to the fascia near the edge of the lunar incision, which is then sewn in layers. Drainage is stated by Paterson to be maintained for a considerable time, and relief to the patients has been marked.

REFERENCES.—[1]*Quar. Jour. Med.* 1911, Jan; [2]*Sem. Méd.* 1910, 433; [3]*N.Y. Med. Jour.* 1910, 403; [4]*Bost. Med. & Surg. Jour.* 1910, Nov. 17; [5]*Lancet*, 1910, Oct. 29.

PERNICIOUS ANÆMIA. *Robert Hutchison, M.D., F.R.C.P.*

Grawitz[1] says that there is no *blood picture* which is absolutely characteristic of pernicious anæmia, and that we still must include under that title, "such very grave forms of anæmia as arise without any recognizable organic affection and without parasitic influence, as the result of a specific injury involving the red blood corpuscles." He considers that it may be brought about by the following causes:—(1) Chronic loss of blood, e.g., from hæmorrhoids; (2) The action of toxic substances, e.g., lead, arsenic, carbonic oxide, possibly morphine, and some toxins of unknown nature; (3) Unhygienic mode of life and habits; (4) Intestinal intoxications. The last are the most important cause of all, and in their production a primary lack of free hydrochloric acid in the stomach plays an important part.

TREATMENT.—This must depend upon which of these causes is at work, but in the great majority must be directed against the intestinal intoxication. He describes his anti-intoxication treatment as follows: Is in the main **Dietetic,** and is carried out by ingesting on the one hand no animal albumin, which is to be regarded above all as a source of toxin-formation, and secondly, by trying to prevent a decomposition of the foodstuffs. The first point of this treatment is accomplished by giving these patients at first exclusively carbohydrates and fats in the most digestible form, vegetables, fruits, soups, and at the same time foodstuffs which stimulate the appetite, avoiding, however, meat and eggs entirely. If these patients are in a high degree of exhaustion, we may give substances very rich in albumin, as in nutritive enemas, eliminating thereby the above-mentioned dangers.

The second way of disinfecting is at the beginning the best—regular **Lavage of the Stomach** with a 1 to 2 per cent sodium chloride solution, and at the same time a daily irrigation of the gut, likewise with a solution of sodium chloride, by which the mucosa is best and most safely cleansed, and at the same time stimulated. If the patients are too weak to bear the lavage of the stomach, we must restrict the treatment to ingesting fresh juices of fruits, best lemon-juice in form of lemonades, thus supplying a certain substitute for the lack of hydrochloric acid in the stomach. This is the same treatment that has been applied for scurvy, which also depends undoubtedly upon a putrefaction of albumin. The use of disinfectants, such as calomel, is not indicated. If the patients are very exhausted, **Alcoholic Drinks** may be allowed. Special attention has to be directed to the condition of the always affected heart-muscle, and therefore it is best to administer **Digitalis** preparations from the very beginning. Of course, the patients must, at first, be confined to bed.

The usual course now is that under this dietetic and strengthening treatment the temperature, which is always increased at the beginning, goes down; the appetite, being usually entirely absent, begins to come back, and the patients feel better. This is the time to begin treatment by injection of a neutral 1 per cent solution of **Sodium Arsenate** in increasing doses from 1 mgram to 1 cgram daily. The application of inorganic preparations offers the advantage that the toxic symptoms are known and can easily be recognized, while the organic preparations, especially atoxyl, as we know, in not a few cases lead to the most severe symptoms of intoxication, especially to blindness.

Grawitz does not consider iron of any use in pernicious anæmia. Bovaird[2] has recorded three cases of **Transfusion of Blood** in pernicious anæmia, and in two of them secured a remarkable and immediate improvement. He considers that, as a last resort, transfusion offers the possibility, not only of averting death, but, for a time at least, of restoring the patient to comparative health and comfort, and initiating one of the periods of quiescence so characteristic of the disease. He points out, however, that the treatment is not without danger, first

from immediate hæmolysis of the new blood; and, secondly, from a possible effect of the new serum, which is of the nature of an anaphylactic reaction. Before carrying out the transfusion, therefore, the action of the blood of the donor should always be tested upon that of the recipient with respect to hæmolysing and agglutinating power.

Patek[3] believes that pernicious anæmia is greatly on the increase, and records a remarkable instance of three fatal cases in one family, along with one in a paternal cousin, and another in a paternal uncle.

The use of **Sodium Cacodylate** is recommended on *page* 11; **Salvarsan** experiments are referred to on *page* 55.

REFERENCES.—[1]*Med. Rec.* 1910, Oct. 29; [2]*Ibid.* 1911, Feb. 11; [3]*Jour. Amer. Med. Assoc.* 1911, May 6.

PERTUSSIS.

(*Vol.* 1911. *p.* 22)—**Bromoform** is very useful, but it is insoluble, and therefore difficult to prescribe except in capsule form.

PHLEBOTOMUS FEVER. *Leonard Rogers, M.D., F.R.C.P.*

F. Wall[1] gives a good account of sand-fly fever in Chitral, illustrated by temperature charts. He classes the great majority of short fevers seen there under this head. Sand-flies sent to the Calcutta museum were identified as *Phlebotomus pappatasi* and *P. babu*, and they were very abundant in the Fort at Chitral during the fever season. From 70 to 80 per cent of Europeans and Gurkhas from a hill station were attacked, but only 5 to 6 per cent of Sikhs and Punjabi Mohammedans from the plains, where this fever prevails, thus indicating that most of the last-named were immune owing to previous attacks. Certain movements of the troops allowed the incubation period to be fixed at not less than five days, and more commonly six or seven days. The severity of the general symptoms varied greatly. The commonest duration was about three days, but one-third showed a slight secondary rise after an interval of apyrexia, while in only 7 out of over 400 cases did a relapse take place. He never saw a rash, while the pulse was rapid, usually from 100 to 120, with a temperature from 101° to 102° F. Prostration was marked. **Phenacetin, Caffein Citrate,** or **Bromides** gave most relief, especially the last. Vacating the infected barracks and placing the men under canvas had a marked effect in reducing the number of cases. No man suffered from a third attack, so some immunity appears to result.

Llewellyn Phillips[2] records the occurrence of phlebotomus fever in Cairo during the last three years, which agrees closely with Dôerr and Birt's descriptions. The *P. pappatasi* abound in Cairo. The disease differs from dengue in the absence of rashes, in its incidence all through the hot weather instead of in autumn epidemics, and in the rarity of relapses. T. G. Wakeling[3] also records the same fever as occurring in the hot season in Egypt, with a rapid pulse, late anæmia, and an incubation period of four days. It incapacitates a considerable percentage of the population. P. J. Marett[4] records in detail his observations on the life-history of the phlebotomus at Malta. He was successful in

breeding from the eggs laid by the flies in test-tubes containing detritus composed to a great extent of the excreta of woodlice and lizards. Pregnancy in the flies lasted eight to ten days, and the eggs hatched out in six to nine days more, a moist atmosphere being necessary for this stage. Attempts to breed in earth were never successful. The flies first appeared in May soon after the termination of the rains, increased up to June, but became scarce in the hot dry month of July up to the onset of moist sirocco winds late in August, and disappeared in November with the onset of winds and rain. He thinks the larval forms hibernate, many being killed by rains. As wells form the breeding-ground, they should be reduced as much as possible, and those remaining be lined with cement as a preventive measure. Spraying barracks with formalin solution is useful in getting rid of the flies.

References.—[1]*Ind. Med. Gaz.* 1911, 71; [2]*Brit. Med. Jour.* 1910, Oct. 1; [3]*Ibid.* 1910, Oct. 15; [4]*Jour. R.A.M.C.* 1911, ii, 12.

PHLEGMON OF THE FINGERS.

For the use of **Glycerin** compresses, see *page* 16.

PLAGUE. *Leonard Rogers, M.D., F.R.C.P.*

The Advisory Committee of Plague Investigations in India have issued a fifth extra number of the *Journal of Hygiene*[1] containing 250 pages of data. Section 33 deals with the experimental production of plague among rats in godowns, with and without fleas. These experiments were prompted by the criticism that investigations with guinea-pigs would not apply to rats, on account of the frequency with which the latter eat one another's bodies, by which means infection might be conveyed in the absence of flea infection. This criticism is completely met by the experiments now recorded, for in eight instances where no fleas were present in the control godown, not one out of 125 uninoculated healthy rats added to 84 infected ones, contracted the disease; while in the godown with fleas, 45·6 per cent of the uninoculated rats died of plague contracted from the infected ones. Moreover, those rats which survived exposure to flea infection were found to be highly resistant to plague. The next section deals with resolving or chronic plague in rats as evidenced by the presence of abscesses in the spleen and tissues. Further experience has shown that these are recovering, and not chronic cases of plague. Section 35 deals with the spread of plague through districts with scattered villages, the data having been put together by Lamb (whose recent death is a great loss to the Plague Committee and to medical science in India). The data are held to support the view that recurrent outbreaks are due rather to fresh importation than to recrudescence, although a statistical analysis by M. Greenwood is said to lend some support to the importation theory, but not to exclude the possibility of the recrudescence one being correct. Section 36 records a close study, with maps, of plague in Belgaum. In this town the disease becomes epidemic only from late in July to November each

year, in which season the rat flea is also at its maximum prevalence; from which it is concluded " that the onset of the epidemic, if infection be present, follows and is determined by a rise in the number of rat fleas." In Poona, on the other hand, plague epidemics may occur at different seasons of the year, depending largely on the time the infection is planted ; the epidemics being most severe when they coincide with a rising flea prevalence. During the last two epidemics the mortality is believed to have been considerably reduced by the extensive use of (*a*) evacuation of houses as soon as rats began to die, (*b*) inoculation, and (*c*) destruction of rats.

Section 38 by Sydney Rowland deals with an important investigation into plague vaccines. By suitable chemical processes two protein substances, consisting largely of nucleo-protein, can be separated, which have the power of producing immunity and are also toxic. The second is the more powerful, and has considerable advantages as an immunizing agent in being easier to standardize and sterilize by filtration, and in the smallness of the dose to be injected.

The final section, 39, briefly summarizes the work of the committee in the form of an interim report, in which they come to the following conclusions: The plague bacilli multiply in the stomachs of rat fleas, which can convey the infection up to three weeks after imbibing plague-infected blood. In the absence of rat fleas the disease does not spread from infected to healthy rats, so " in nature plague is spread among rats by the agency of rat fleas." Epidemic plague in man in the bubonic form is not directly infectious from man to man, as shown by hospital experience. Epidemics in man are always associated with epidemic plague in rats, the mortality among which provides a large number of infected rat fleas, which will bite man in the absence of their natural hosts. In infected houses, rat fleas containing plague bacilli and capable of infecting animals are found, and will infect susceptible animals placed in such houses, unless they are protected from the bites of fleas, when they escape the disease. Numerous experiments have shown that in the absence of fleas no animal infection arises from exposure to soiled floors, plague cultures, or bedding soiled with excreta of plague patients. " The Committee, therefore, consider that in the great majority of cases, during an epidemic of plague, man contracts the disease from plague-infected rats through the agency of plague-infected rat fleas." They have obtained no evidence that in ordinary circumstances the plague bacillus survives for more than a few days outside the bodies of men, animals, or fleas. In large towns plague may persist throughout the year in small numbers, but in villages it frequently dies out, and appears to be commonly reimported the next season. In the case of annual outbreaks, the rat epidemic, on which the human one depends, occurs during the part of the season when fleas are most prevalent. There is no evidence that the spontaneous movement of rats ever carries plague more than short distances. Importation into a fresh locality is usually

through human beings, and possibly through infected rat fleas carried in merchandise.

D. Douglas Gray[2] gives an interesting description of the terrible outbreak of septicæmic and pneumonic *plague in Manchuria* in the autumn of 1910. As physician to the British legation in Pekin, he had every opportunity of obtaining reliable information. The disease began among Chinese labourers in the north-west of Manchuria, and was spread all over the province by them on their way south to their homes at the onset of the winter. Owing to the great cold they huddled together in small huts, and the infection spread rapidly among them in the pneumonic and septicæmic forms, in the absence of rat infection or bubonic cases, and also broke out in the crowded railway carriages on their journey. As a result of the complete absence of rat plague it was easy to trace the spread of the outbreak, which attained an unusual degree of virulence. The incubation period was usually five days, and the sputum expelled during coughing was the main source of infection. The blood commonly contained the plague bacillus, showing the septicæmic form, but no glandular enlargement occurred except in one case in which it was followed by secondary plague pneumonia. The disease appears to have originated from infection of the Mongolian marmot or "tarabagan," which is much hunted for its valuable skin. For some years past it has been known that the hunters occasionally became infected from sick animals, but experienced men knew how to avoid these. Owing to increased demand many inexperienced hunters were at work, who killed and skinned sick animals. The plague originating thus, found in the autumn of 1910 crowds of susceptible coolies at hand, among whom the disease soon obtained epidemic proportions. The Russian and Chinese authorities made great efforts to deal with this terrible epidemic. Railway carriages were successfully used for isolating those who had been exposed to infection, and at Harben, for the first time on record, the Chinese burned over 3000 corpses to destroy the infection in them, as the ground was frozen and they could not be buried. The mortality lists showed a total of 42,302 deaths, which are probably not much underestimated. Fortunately the disease appears to have died down without having infected the rats, so that this outbreak forms a marked exception to Indian experience as recently summarized by the Plague Committee. Wu-Lien-Teh,[3] who was in charge of the Chinese measures during the Manchurian outbreak, in an address before the International Plague Conference at Mukden, also deals with the epidemic, and lays stress on the fact that for the first time in history the Chinese Government has asked for and made full use of expert medical knowledge of European authorities on the disease. The details agree with those given above.

George W. McCoy[4] reports on the infection of ground squirrels in California, and points out the danger of men or rats being infected from them, although there is no evidence at present that any serious epidemic has arisen in this way.

H. H. Brown and H. P. Sleigh[5] both report on four cases of plague pneumonia in one household in Suffolk, in September, 1910. The presence of the plague bacilli, both in some of these human cases and in a number of rats from the neighbourhood, was confirmed by Professor Klein on behalf of the Local Government Board, who have also issued[6] a memorandum briefly describing the disease and the best methods of prevention, laying great stress on the importance of destroying as many rats as possible in the infected area. This policy has been pursued with apparent success.

H. Albrecht[7] deals with the pathogenesis and prophylaxis of plague. The use of anti-plague serum affords only brief protection, but inoculation a longer one.

A. N. Sinclair[8] reports three cases of plague treated at Honolulu by dry **Yersin-Roux Serum,** made at the Paris Pasteur Institute. The first developed pneumonic complications and died, but he believes the other two, who recovered, were materially benefited by the serum treatment, the temperature falling after its injection and again on its repetition in the second case.

The Pneumonic form was not cured by **Salvarsan,** as recorded on *page* 55.

References.—[1]*Jour. of Hyg.* 1910, x, No. 3, Nov.; [2]*Lancet*, 1911, i, 1152; [3]*Ibid.* 1117; [4]*New York Med. Jour.* 1910, 653; [5]*Brit. Med. Jour.* 1910, Nov. 12; [6]*Jour. Trop. Med. and Hyg.* 1910, 376; [7]*Wien. klin. Woch.* 1911, 443; [8]*Jour. Amer. Med. Assoc.* 1911, 332.

PLEURISY. *J. J. Perkins, M.B., F.R.C.P.*

Diagnosis.—Von Koranyi[1] advocates the method of *auscultatory percussion* in the diagnosis of pleural effusion. For the purpose he employs a simple binaural stethoscope with two indiarubber tubes fitted with olive-shaped vulcanite ends for the ears. The point of the left index finger is pressed well home into the surface of the thorax between the ribs, and then struck with the firmly extended finger of the right hand, the method being a modification of Reichmann's, in which a rod pressed well home was employed, which was percussed with the finger. As long as the stethoscope and the finger are placed over, e.g., the same solid organ, a peculiar ringing sound is heard which ceases at once when the finger passes beyond the limit where the organ is in contact with the parietes. V. Koranyi notes that the distance between the finger and the stethoscope must not be too great, or the sound may be so altered as to lead to error, and the finger must therefore methodically follow the stethoscope in percussing. Again, the ribs being good conductors of sound, the finger must be well pressed down between them, especially in the neighbourhood of the sternum.

By the application of this method, a pleural effusion will be found to extend far below the marginal vault of the thorax, as the exudation by its weight tends to push the diaphragm down, while on the other hand the collapsed lung can be shown to be highly placed in the posterior part of the thorax about the level of the ninth rib in the scapular region. According to the author, the effusion if percussed

towards the spinal column, will be found to cross the middle line towards the healthy side. Von Koranyi has found his method of great use in diagnosing the presence of an effusion in association with pneumonia. The stethoscope being placed within the scapular line, he slowly percusses outwards. If an effusion exists, the dullness will follow the costal curve, but in the case of pneumonia without effusion the alteration in sound will be two inches higher than the curve. In conclusion, it should be noted that the thick masses of muscle on both sides of the spinal column are good conductors of sound, and if percussed may lead to an erroneous conclusion; if the scapular line be taken there is less risk of error.

TREATMENT.—The objection has been raised to the treatment of chronic pleural effusion by **Drainage,** that the plan must necessarily lead to the discharge becoming purulent. Stretton[2] entirely contradicts this view, and quotes a case of his own in which free drainage after excision of rib was kept up for a month without suppuration. Previously, the pleural cavity had been drained by means of the introduction of a rubber tube for three weeks without suppuration. No improvement followed either method, and Stretton concludes that drainage is of little or no value.

For the use of **Hexamekol** to relieve pain, see *page* 18.

REFERENCES.—[1]*Med. Press*, 1911, Aug., 117; [2]*Pract.* 1911.

PLUMBISM.

(*Vol.* 1911, *p.* 517)—Stephens recommends **Calcium Permanganate** in ¼-gr. doses, mixed with paraffin and put up in capsules.

PNEUMONIA. *J. J. Perkins, M.B., F.R.C.P.*

Gibson's[1] views as to the bearing of the *ratio between the blood-pressure and the pulse-rate* in pneumonia on prognosis and treatment are confirmed in a paper by Goodman and Pitman.[2] These, as expressed in his own words, are that a pressure appreciably below the normal in pneumonia is invariably of evil omen, and any considerable fall bodes disaster. When the arterial pressure expressed in mm. Hg does not fall below the pulse-rate expressed in beats per minute, the fact is of excellent augury, while the converse is equally true. By following this method, the first sign of a failing heart will be detected and the necessity for stimulants and cardiac tonics made clear long before the pulse or heart sounds indicate their need. These drugs should be given by the use of this standard just to the degree necessary to maintain the blood-pressure higher than the pulse-rate. Goodman and Pitman's series of cases completely bear out this view except in one point, namely, that in cases of arteriosclerosis, or of nephritis, or any condition usually associated with an increase in blood-pressure, the patient may have in pneumonia a pressure higher than normal and yet relatively low for that individual. They conclude by saying that they believe that the ratio of blood-pressure to pulse-rate gives a relatively correct indication for the use of stimulants. Daily investigations are insufficient, and

blood-pressure should be taken and charted as frequently and carefully as temperature, pulse, and respiration.

Gibson[1] regards this method and the investigation of the blood as two of the most important elements in prognosis in pneumonia. He admits, however, that the rule regarding the relation of arterial pressure to pulse-rate is only applicable to adults in the prime of life. Children have a lower arterial pressure and a higher pulse-rate than their seniors, while elderly people are very liable to have a higher pressure and a lower pulse-rate than the young. In such individuals there may be imminent danger in spite of the fact that the arterial pressure stands at a higher level than the pulse-rate.

Among the changes in the blood which are of importance is the *degree of leucocytosis*. A mild leucocytosis of from 15,000 to 20,000 gives the most hopeful outlook, as it points to a mild toxæmia with sufficient powers of reaction ; a higher count (20,000 to 60,000) signifies a more serious toxæmia, while an absence of leucocytosis is of the gravest omen, as showing that the patient has no sufficient power of reaction. With the crisis the leucocyte count falls ; when suppurative complications occur, an increase of leucocytes follows, and is a valuable aid to diagnosis. Gibson has attempted to increase the leucocytes when too low by the injection of **Leucocytic Extract** obtained from an experimental pleural effusion in a rabbit, but has not yet seen enough of the method to be able to say more than that it holds out hopes of benefit. In cases where there is severe toxæmia and great leucocytosis, he has seen wonderful results follow the hypodermic injection of 2 gr. of the acid **Hydrochloride of Quinine** every two hours or every hour.

Hale White,[3] commenting on the necessity of carefully watching the pulse in pneumonia, holds that there is no better drug to strengthen and slow the heart than **Digitalis.** A favourite mixture with him is

R	Tinct. Digitalis	℥xv	Sod. Salicyl.	gr. iiss
	Liq. Strych.	℥ x	Aq.	ad ℥j
	Caffein.	gr. v		

Every four hours.

He likewise has a great belief in the value of **Strychnine** hypodermically, and gives on occasion as much as 10 min. every four hours, in this agreeing with Gibson, who says that when there is a tendency to general prostration with nervous exhaustion, no remedy appears to him to equal strychnine hypodermically. Hale White has tried **Adrenalin** for cardiac failure (10 min. of 1–1000 solution hypodermically) ; it has the disadvantage that its effect is but temporary, and in this respect is much inferior to **Pituitary Extract** (1 c.c. injected deep into the muscles or subcutaneously). He has never known any harm result from the use of the latter, and quotes one instance where surprising benefit followed.

He advises **Alcohol** when the clinical result, viz., improvement in sleep, digestion, and pulse-rate, shows that it is agreeing with the patient, and under these circumstances he would allow as much as

5 oz. of brandy in the twenty-four hours. Excitement, insomnia, and rising pulse will of course be contra-indications.

Speaking of **Oxygen**, Hale White insists that it is often very badly given, and advocates the plan in use in his own wards of pinning the funnel to the bedclothes quite close to the patient's mouth, so that with every respiration he must be taking in some oxygen. Of course the gas should be warmed by allowing a few of the coils of the rubber tube to lie in hot water. Gibson's belief in the efficacy of the free administration of oxygen has been considerably strengthened by the results obtained by Haldane and Poulton in the treatment of Cheyne-Stokes breathing by excessive oxygenation. Their investigations are borne out, he says, in a remarkable manner by the gratifying improvement seen in the treatment of pneumonia by the free administration of oxygen. D. B. Lees[1] refers to the paper of Willcox and Collingwood on the beneficial effects of the inhalation of **Alcohol Vapour** combined with oxygen in cardiac failure. The oxygen is bubbled through absolute alcohol in an ordinary washbottle; it is non-irritating, gives rise to no ill-effects, and strengthens the pulse, causing a considerable increase in blood-pressure. (*See also page* 5.)

Among the drugs which have been found of great value in treating cardiac failure in pneumonia is **Camphor**, first recommended by Seibert. Weber[5] reports a desperate case of pneumonia with intense pneumococcic septicæmia, which ended in complete recovery, contrary to all expectations. A 20 per cent solution of camphor in oil of sweet almonds was used, and about 30 gr. of camphor injected daily for four days. When aseptically done, with the needle well thrust down into the cellular tissue, no pain or swelling is caused.

Springthorpe[6] insists on the advantage of **Cardiac Stimulants** in immense doses under the conditions of imminent but transient stress obtaining in pneumonia, and quotes the details of a case with pulse 140, respiration 60, who received in the course of seven days 34 dr. of spt. ether, a like quantity of spt. ammon. aromat., 1·5 gr. of strychnine, 8½ gr. of strophanthus, and 16 oz. of brandy, with good result.

As regards the use of **Morphia**, Hale White holds that of all drugs used in pneumonia most good comes from opium, while Gibson says that one of the most essential points in the treatment of pneumonia is to ensure that the patient sleeps well. The fear of opium as a powerful respiratory depressant has been overdone in pneumonia, and as McKechnie[7] points out, we not only obtain sleep and diminish restlessness by its use, but by its power of relieving visceral pain it restores the free movement of the lung and so prevents the dilatation of the right heart which so often leads to a fatal ending. During the last ten years he has given morphine to between 200 and 300 adults suffering from acute lobar pneumonia, and cannot recall a single instance in which there appeared to be any harmful effect; by its relief of pain, morphia under these conditions tends to deepen respiration, and an improvement in colour and circulation is often noticeable immediately after its use.

As regards the use of a **Vaccine** the tone is hopeful. Schäfer's treatment by vaccine is given on page 63.

Writing of *post-operative pneumonia*, Graves,[8] from an analysis of 2000 consecutive operations, concludes: that operative shock, method of administration of the anæsthetic, length of time of the anæsthesia, age of the patient unless extreme, have none of them any constant relationship to this condition. Two points have come to light in the course of his investigation, viz., that post-operative pneumonia occurs most frequently during the cold months and is rare during the summer months; and that pre-existing foci of infection in the lungs, e.g., of tuberculosis, are almost invariably lighted up under ether anæsthesia He suggests, therefore, that most cases of post-operative lung complications are due to the aggravation of pre-existing foci of disease from the irritative action of the ether, and that the complication could often be avoided by a more careful previous examination of the lung.

References.—[1]*Glasg. Med. Jour.* 1911, May; [2]*Ther. Gaz.* 1911, 464; [3]*Guy's Hosp. Gaz.* 1910, Nov. 26; [4]*Lancet*, 1911, Feb. 25; [5]*Med. Rec.* 1911, Jan. 28; [6]*Austral. Med. Jour.* 1910, Nov. 20; [7]*Lancet*, 1910, Sept. 24; [8]*Bost. Med. and Surg. Jour.* 1910, Sept. 29.

PNEUMOTHORAX. *J. J. Perkins, M.B., F.R.C.P.*

Diagnosis.—Newton Pitt, in the Bradshaw Lecture for 1910, first pointed out that the partial compression of a bronchus might lead to an over-distention of the lung, with physical signs very suggestive of a pneumothorax. Walsham[1] reports two cases from his collection of skiagrams of aneurysm in which this confusion occurred. By the use of *x*-rays, however, the mistake may be avoided by noticing the absence of the shadow which a collapsed lung gives and the increased clearness of the inner intercostal spaces.

Reference.—[1]*Lancet*, 1911, July 22.

PNEUMOTHORAX, ARTIFICIAL. (*See* Tuberculosis, Pulmonary.)

PREGNANCY, DISORDERS OF.

Victor Bonney, M.S., M.D., B.Sc., F.R.C.S.

Miscarriage.—Young and Williams[1] have reviewed the treatment of 2000 cases occurring at the Boston City Hospital. The statistics show that very little advantage attaches to any particular method of emptying the uterus, provided strict sepsis is observed. Of the 2000 cases, 199 are classified as spontaneously complete, and 1333 as incomplete; and of these latter 111 were considered to be infected at an early stage in the process. They found that the percentage of cases in which spontaneous completion occurs, rises from ten in the first two months to twenty-six in the sixth month, showing that retention of part of the ovum is much more likely to occur in earlier pregnancy. This is contrary to the usual statement that complete abortion is more likely to occur before the placenta has formed. On the contrary, they find that the expulsion of a complete early ovum is a rarity. In the

earlier months, when interference was needed, the uterus was cleared out by finger, forceps, and light curettage; but in the later months they advise vaginal packing for twenty-four hours, in order to effect dilatation of the rigid cervix, holding that the rapid dilatation is undesirable on account of the lacerations which such a process necessitates.

Packing the vagina and cervix was successful without other treatment in eight out of twenty-six cases in inevitable miscarriages, but failed in incomplete cases. It is, however, useful on two other counts: (1) That it promotes cervical dilatation, and renders subsequent operation easier; (2) That it controls hæmorrhage, and gives the patient time to recover before resort to operative evacuation of the uterus. Of 1331 cases admitted without fever, only 3 died. Of 523 infected and febrile cases, 6 died. An interesting point was that there was a decreasing percentage of previously-infected cases at successive months, whilst there was an increasing percentage of sepsis during convalescence. This is probably due to the fact that the more advanced the pregnancy the more extensive will be the operation required to evacuate the uterus.

The most important point brought out by the authors is the high percentage of infection, morbidity, and mortality which occurs in self-induced and criminal abortions. The mortality of self-induced abortion was 5·7, and that of criminal abortion 10·2.

Eclampsia.—Leith Murray[2] suggests an analogy between the poison producing eclampsia and snake venom. He suggests a trial of **Antivenin** in these cases. The whole matter is experimental and on trial, and results will be awaited with interest. Peterson[3] has considered the treatment of eclampsia by **Vaginal Cæsarean Section** on the basis of 530 collected cases. The mortality worked out at 23·4 per cent, which appears high when contrasted with Seitz's statement that the death-rate after spontaneous delivery is 20 per cent. It must, however, be remembered that the worst cases of eclampsia die without delivery. The convulsions ceased after the delivery by vaginal Cæsarean section in 62 per cent of the cases; in spontaneous delivery they cease in 59 per cent, a scarcely appreciable difference.

Cessation of convulsions, however, was followed by death in 18 per cent of cases. Where they did not cease the mortality was 28 per cent. An interesting point was the frequency of twin pregnancies, 1 in 31 cases (the normal ratio being 1 in 89). Multiple pregnancy would appear to be a contributing factor. The author's figures show an increasing mortality, both for mother and child, in accordance with the number of fits before delivery; therefore the sooner delivery is effected the better. For this purpose evacuation of the uterus by vaginal Cæsarean section is well adapted. The anterior incision was that most commonly adopted, and it would appear in most cases to be unnecessary to divide the cervix posteriorly as well.

Pregnancies after Abdominal Operations.—Giles[4] has investigated the results of pregnancy after abdominal operations. Seventy-nine

patients were available for the research out of 349 originally operated upon. Of these, no less than 41 had become pregnant after hysteropexy. Giles considers the subject under three heads: (1) What are the chances of subsequent pregnancy? (2) What are the chances of pregnancy going on to full time? and (3) What are the chances of labour being normal?

In reply to these questions—

1. 24 per cent became pregnant after unilateral ovariotomy, 21 per cent after operations for tubal disease, 39 per cent after operations for tubal pregnancy, and 35 per cent after myomectomy. Out of 35 cases of removal of the appendage of one side, no less than 8 developed extra-uterine pregnancy. The liability to this disaster is greatest where the previous removal of the appendage has been necessitated by a tubal pregnancy on that side.

2. No less than 73 per cent of Giles' cases went on to full time. He particularly investigated the results of hysteropexy in connection with its effect on pregnancy, and concludes that the operation has only a slight influence predisposing to miscarriage.

3. This question is answered from a study of 60 confinements. Of these 55 were normal, and in the remaining five the difficulties that arose could not be attributed to the previous operations.

Lastly, the author brings out this interesting point in relation to scar hernias, namely, that in his series of cases the percentage number was actually less in those who had subsequently borne children than in those who had not.

References.—[1]*Bost. Med. and Surg. Jour.* 1911, i, 871; [2]*Brit. Med. Jour.* 1911, ii, 186; [3]*N.Y. Med. Jour.* 1911, ii, 353; [4]*Med. Press*, 1910, ii, 236.

PROSTATE, DISEASES OF. *J. W. Thomson Walker, M.B., F.R.C.S.*

Davis[1] analyzes forty-six cases of **Prostatectomy,** thirty-six performed for benign hypertrophy, nine for cancer, and one for tuberculosis. There were twelve cases of suprapubic prostatectomy, with a mortality of $16\frac{2}{3}$ per cent, and twenty-four cases of perineal prostatectomy, with a mortality of $8\frac{1}{3}$ per cent. The author prefers the perineal method, as he has found less shock and hæmorrhage, and less risk of sepsis, by this method. He also finds that the convalescence is quicker and more comfortable. At the same time he admits that persistent bleeding after a perineal operation contributed to a fatal result. He did not find that the preservation of the ejaculatory ducts obviated the danger of epididymitis as Young claims. Epididymitis during convalescence occurred in 30 per cent of suprapubic and 33 per cent of perineal cases. The average stay in hospital was thirty-three and a half days in suprapubic and twenty-seven and a half days in perineal cases. In six cases a large part of the urine was voided through the perineal wound at the time of discharge, but there was control of the act. In the late results there were two cases of persistent fistula, one of "poor control" of the bladder in which the patient wears a urinal, and one in which there are "lapses of control." For cancer of the prostate

the author does not recommend Young's operation, but prefers a "conservative perineal operation."

A record of a recent series of 200 cases of total enucleation of the prostate by the suprapubic route by Freyer,[2] shows a mortality of 4·5 per cent. The causes of death were uræmia (five), exhaustion (two), bronchitis (one), shock (one). The average age of these patients was sixty-nine and a half years, and there were eleven octogenarians amongst them. The weight of the prostates varied from half to sixteen ounces. In the great majority the patients were entirely dependent on the catheter for periods up to eighteen years. Most of them were in broken health, few were free from serious complications, and many were almost moribund at the time of the operation. In all the nine cases in which death supervened, the patient was afflicted with one or more grave complications, which must have proved fatal after much suffering. It is impossible to avoid a certain mortality when such cases are operated on, but to refrain from operating where there is any prospect of success is unjustifiable.

Two methods of *perineal prostatectomy* for simple enlargement of the prostate are practised at present. In one, median perineal urethrotomy is performed, with intracapsular enucleation; in the other, the posterior surface of the prostate is exposed and the organ removed by transcapsular enucleation. Alexander[3] devotes an article to the technique of median perineal prostatectomy. The patient is placed in the lithotomy position, and after passing a lithotomy staff a median perineal incision is made, and the membranous urethra incised longitudinally up to the apex of the prostate. The right forefinger is introduced along a grooved director, and the mucous membrane is torn through at the side of the prostatic urethra. The right lobe, if both are equal, or the larger, if they are of unequal size, is enucleated with the finger and removed, and then the remaining lobe enucleated. If the middle lobe is enlarged and has not come away with a lateral lobe, it is now removed with the finger or by pulling it down with forceps and cutting away with scissors. If the lateral lobes are very large, adenomatous nodules are removed separately, and care should be taken not to leave any behind. If there is hæmorrhage, it is controlled by pulling down the neck of the bladder with forceps. After washing out the bladder a large rubber catheter (32 F) is passed into the bladder through the perineal wound, and gauze is packed into the cavities from which the lateral lobes have been removed. In twenty-four hours the tube and packing are removed and an ordinary dressing is applied. There is usually complete urinary incontinence for two or three days, then control with perineal discharge. No sound is passed for several weeks after the operation.

The "*fibrous*" *prostate* has been a stumbling-block in diagnosis and the source of unsatisfactory operative results to the inexperienced surgeon. Chute[4] contributes a useful article on this subject. In most cases he could find no obvious cause, gonorrhœa and acute prostatitis having been excluded, and he suggests that the fibrosis is

due to a "very mild infection," probably hæmatogenous. According to the author, no prostate may be felt on rectal examination, or there may be a "fibrous-feeling gland" but no enlargement. A sound is sometimes gripped at the entrance of the bladder. On cystoscopy there may be a little projection of the prostate into the bladder at the sides or in front of the orifice, or a raised collar. Residual urine may be found. There is sometimes difficulty in diagnosis from tuberculosis or carcinoma of the prostate. The tuberculous prostate is ill-defined and tender, and there may be tuberculous epididymitis or vesiculitis. Chute found tubercle bacilli in the urine in all his cases of tuberculous prostate. The malignant prostate is stony hard, but in some cases the author was unable to distinguish between the malignant and the fibrous prostate. Suprapubic and median perineal prostatectomy are unsuitable for these fibrous prostates, and Chute recommends transverse perineal prostatectomy with dissection of the gland.

Squier[5] is an advocate of suprapubic enucleation of the enlarged prostate. Although, theoretically, a small prostatic outgrowth may be the obstructing factor, it is invariably necessary to remove the whole organ in order to obtain successful results. The author had better results with suprapubic than in perineal operations, without any post-operative incontinence of urine. Death following prostatectomy usually results from shock, renal insufficiency, or pulmonary embolism, and the two former are influenced by the duration of the anæsthesia. In order to reduce this, the author makes all preparations before the anæsthetic is commenced, and uses iodine to sterilize the skin. He opens the bladder high up near the fundus, as he believes that healing is more rapid here. Instead of commencing the enucleation at the most prominent lobe, the finger is inserted into the prostatic urethra and breaks through the anterior wall beneath the anterior commissure. Enucleation is now commenced by freeing the apex of the prostate, and the prostate is turned into the bladder with its apex pointing upwards. The author does not introduce his finger into the rectum, but relies upon the help of an assistant's fingers. The operation is completed in five or six minutes.

The author also finds that this is the most efficient method of dealing with small fibrous prostates or fibrous contraction of the vesical neck. In his opinion the two-step operation for prostatectomy by performing a preliminary cystotomy has been too much exploited, but he admits its value when there is sepsis and fever, and when intermittent or constant catheterization is impracticable.

Judd[6] reviews 542 cases of prostatectomy performed in St. Mary's Hospital, Rochester, Minn. There were 461 operations for benign hypertrophy, 74 for cancer, and 7 for tuberculosis. During the past few years the mortality has been reduced and convalescence hastened by more careful preparation of the patients for operation. The secondary symptoms are relieved by constant urethral or suprapubic drainage; and the circulation is filled and the kidneys are stimulated by giving large quantities of fluid. It was found that when there

was residual urine the specific gravity became much lower after the introduction of a permanent catheter. An operation should not be performed until the specific gravity has risen again, which may take place in from one to several weeks. The perineal operation was performed in most cases on account of the easier and more rapid convalescence, but a suprapubic operation was performed if there was stone or an intravesical projection, or if the finger could not reach the upper border of the gland from the rectum. The mortality in these cases was not affected by the type of operation. The average time taken for the urinary fistula to heal in perineal cases was twenty-one days, in suprapubic cases forty days. There were three persistent fistulæ in suprapubic cases and six in perineal cases. Epididymitis and orchitis were more common after perineal than suprapubic operations. There were no cases of incontinence following the suprapubic operations. Seven perineal patients had some degree of incontinence, and in eleven additional patients "the retentive power was not strong, but they were able to retain several hours before starting to dribble." Several patients did not get good control till some weeks after the operation.

At the International Congress of Urology, Young[7] recorded his experience of the results of prostatectomy. There were 85 Bottini operations, 45 suprapubic prostatectomies, and 450 cases of perineal prostatectomy. The following statements refer to the perineal operation which the author advocates. The fistula closed in 18 cases during the first week, and in 56 per cent of cases in less than twenty-one days. In 14 per cent the fistula was present after the sixth week, and in 27 cases it persisted longer than the third month. In four patients there had been almost complete retention of urine after the operation, and in 8 cases there was a partial return of obstruction. There were five cases of post-operative diurnal incontinence, and in two of these the further removal of small lobules at the vesical orifice cured the incontinence. The author believes that the preservation of the floor of the urethra, ejaculatory ducts, and verumontanum has a distinct effect in preserving the sexual powers, and renders epididymitis much less frequent.

In order to facilitate the removal of the prostate by the perineum, Martini[8] has introduced an instrument resembling Young's retractor, but having three wings instead of two. Near the distal end is a groove, into which fits a trifoliate cutting instrument. The prostate is exposed, the retractor passed into the bladder, and the cutting instrument fitted into it and pushed home, cutting the posterior wall of the prostatic urethra from before backwards. The cutting instrument is now removed, the gland dissected off the urethra, and the lobes enucleated.

Prostatitis.—Le Fur[9] relates a number of cases occurring in men habitually in the saddle, such as cavalry officers, huntsmen, jockeys, and riding-masters. There is frequent and difficult micturition, which may amount to complete temporary retention, and burning on micturition. If there is no infection, there is congestion of the prostate,

prostatorrhœa, aseptic prostatitis, and early adenomatous enlargement of the prostate. If there is infection of the urethra and prostate, the infection is prolonged, and cystitis and prostatic abscess may supervene. Fibrous prostatitis follows, with pain and tenesmus, but without retention. Similar conditions may be found in cyclists and in motorists.

Treatment consists in removing the cause by interdicting horse-riding, etc. **Massage** of the prostate sometimes produces excellent results.

References.—[1]*Bost. Med. and Surg. Jour.* 1911, i, 519, 565, 609, 639; [2]*Lancet*, 1911, i, 923; [3]*Ann. Surg.* 1911, 390; [4]*Bost. Med. and Surg. Jour.* 1910, ii, 607; [5]*Ibid.* 1911, i, 911; [6]*Jour. Amer. Med. Assoc.* 1911, i, 459; [7]*Med. Press*, 1911, ii, 148; [8]*Rev. de Chir.* 1911, 275; [9]*Nord Méd*, 1911, Jan. 1.

PRURITUS.—Treatment by **Radium** (*see page 78*).

PRURITUS ANI. *E. Graham Little, M.D., F.R.C.P.*

Wallis[1] recommends the following ointment:—

℞	Chloretone		Cremor. Euthymol	℥ij
	Ext. Conii	āā ℥j		

This is applied after the local skin area has been well washed with soap and water. If any eczematous condition is present as well, this lotion may be used:—

℞	Calaminæ (Corbyn's No. 3)		Aq. Calcis	
	Zinci Oxidi		Aq. Aurant. Flor.	āā ℥iv
	Liq. Carbonis			
	Glycerini	āā ℥j		

A 2 per cent solution of **Tinct. Iodi** in spirit will also give temporary relief. The urine should always be examined for sugar. Rudaux[2] recommends the use of **Hot Chloral Lotion** 10 per cent four times a day, to be followed by the application of this ointment:—

℞	Ichthyol	1 part	Adipis Benz.	5 parts

When the more acute symptoms have disappeared, the following powder may be dusted on:—

℞	Zinci Oxidi	3 parts	Talcis	29 parts
	Bism. Carbonat.	4 parts		

References.—[1]*Pract.* 1911, 419; [2]*Ibid.* 263.

PSORIASIS. *E. Graham Little, M.D., F.R.C.P.*

Bulkley[1] reports 140 cases (68 male and 72 female) treated by strict **Vegetarianism**, and is convinced that the disease is due to faulty metabolism, and especially to inability to digest proteids. While there may be recurrences even when the patient is under strict dieting, these are less obstinate and much less frequent than when the diet is mixed. The restriction may require to be prolonged indefinitely; it means the absolute exclusion of all kinds of meat, poultry, fish, eggs; coffee, chocolate, and cocoa are better avoided. Butter may be conceded,

but milk as a beverage is not allowed ; sweets must not be eaten more than sparsely. Rice is one of the best starch-foods patients can take, and psoriasis is rare in rice-eating countries. The urine of psoriatic patients is on the average of high specific gravity (1026) and hyperacid, with increased urea, uric acid, and urates. Hence the value of **Alkaline Diuretics** in this disease.

For the use of **Chrysarobin,** *see page* 13.

REFERENCE.—[1] *Jour. Amer. Med. Assoc.* 1911, ii, 714.

PSYCHO-ANALYSIS. *Bedford Pierce, M.D., F.R.C.P.*

The value of psycho-analysis in the treatment of hysteria and other neuroses is now generally admitted. It has, moreover, been used with success in the treatment of insane patients suffering from definite delusions. There is, however, considerable doubt as to how far it is prudent to rely upon psycho-analysis as a therapeutic agent, and much controversy has arisen in consequence. As a means of elucidating symptoms, of tracing their development, and of understanding their significance, there can be no doubt whatever as to its value.

Bernard Hart[1] reviews in detail Freud's conception of hysteria, and describes the theories underlying the methods of psycho-analysis. He also gives a list of the authorities who accept Freud's teachings, as well as those who are opposed to it and those who take an intermediate position. He concludes : " Freud's psychology has now reached a stage of development which calls imperatively for complete investigation and appraisement of its value. . . . Should it be found that the structure satisfies the requirements of science, then Freud's achievement must be reckoned one of the most considerable in the history of human knowledge. . . . there is a growing consensus of opinion that Freud's works bear everywhere the impress of an extraordinary acute and original intelligence, that his theories are at any rate remarkably suggestive and stimulating, and that he points the way to many lines of research which have never been previously attacked."

In the *Medical Annual*, 1910 and 1911, the outlines of Freud's teaching were explained, and the *methods* of investigation continue in the main upon the same lines, viz. : (1) Free association ; (2) Word association ; (3) Dream analysis. The *object* of the analysis is to discover subconscious memories of past experiences which, being distasteful or unacceptable, are repressed. The investigation is concerned with incidents which happened long ago, probably in infancy and which cannot be remembered. These hidden painful memories, " complexes " as they are called, do not normally cause trouble ; they are " sublimated " and replaced by healthy interests. In the psycho-neuroses the complexes are not assimilated, and by " transference " they lead to a train of mental symptoms, which unconsciously express a wish-fulfilment. The repressed memories cause a certain degree of mental dissociation, and in this way phobias, hysterical palsies and contractures, tics and obsessions may arise. The patient is unwilling to acknowledge the existence of these hidden motives ; he may be

altogether unaware of their potency, and he resists investigation. Ernest Jones[2] describes psycho-analysis as follows :—" Psycho-analysis is a method, having its special technique, that was devised for the purpose of overcoming these resistances in order that the unconscious mental processes may be led back into consciousness. The chief aim of the treatment is to give the patient a better understanding of the innermost part of his mind, so that he may be in a position to divert the mental energy that was finding an outlet in the form of neurotic symptoms into some more suitable and useful social channels." In other words, psycho-analysis implies a kind of re-education : first, the discovery of the morbid habits of thought, and then the establishment of new relations with the world on healthier lines. The tangled skein is carefully unravelled and the thread is wound afresh.

It is only possible to give a brief outline of some of the recently *reported cases* of psycho-analysis. The steps in the process are numerous and the details intricate, so that a report on a case, if given in full, occupies an extraordinary amount of space.

Devine[3] describes the pathogenesis of a delusion in a schoolmistress who was treated with striking success by psycho-analysis. She had delusions of unworthiness, and considered herself a centre of infection. Careful investigation of her history, assisted by word-association, showed that these delusions were connected with a conflict in her mind as to whether it was right for her to marry. She had repressed her doubts on this subject, and endeavoured to ignore them, but the subconscious conflict by " transference " resulted in the development of a delusion that she was infected and unfit to marry. The patient recovered when the underlying cause of the delusion was brought to light.

Frink[4] describes a case with a mixed neurosis: a girl, aged twenty-eight, who was depressed, thought herself disliked, she constantly desired to make herself ill, tried to catch infection, especially typhoid fever, was constantly taking drugs of all kinds, and had repeatedly attempted suicide. In the course of three months' work spread over a year, the symptoms were shown to depend upon a whole series of sexual irregularities which dated from early childhood. He concludes, " The change in the patient has been remarkable. She is happy and cheerful and has lost her over-sensitiveness, her compulsions have ceased entirely, and her mind has ceased to dwell upon erotic things. She tells me that the memory of her misdeeds no longer disturbs her, and that all these affairs are fading out of her mind like a bad dream. I feel this case worth reporting, because it shows a favourable result through analysis after sanatorium treatment, re-education, and hypnotic suggestion had failed."

Burrow[5] relates the case of a schoolmistress, aged fifty, with constant nausea, convulsive movements of abdomen, and partial paralysis of both legs, and in a state of extreme inanition, whose symptoms were traced to repressions due to the sudden death of her fiancé. The

analysis of the patient's dreams showed that the frustrated undercurrents of her life were subtly and symbolically fulfilled in the unconscious vagaries of sleep. " In the discovery of these repressed, unrecognized wishes unearthed through the analysis of her dreams, the patient's life appeared to her now in a new light . . . until at the end of two months the patient was restored to her former efficiency."

Pfister,[6] a clergyman, in two articles dealing with the educational value of psycho-analysis, relates several cases of juvenile depravity which had been successfully treated. He also gives a case[7] of a boy with abnormal hatred of a brother, who recovered by means of psycho-analysis.

Wingfield[8] relates four cases treated by hypnotism, in all of which treatment was unsuccessful until directed to the underlying cause of the symptoms. A man, aged thirty-six, had an intense feeling of dread of some catastrophe ; by means of automatic writing he was able to give the origin of this fear, viz., that when a child he had witnessed his father's death from pulmonary embolism. A lady, aged twenty-four, with pain on the left side of the head, was told under hypnosis she would dream of something connected with her illness, and she dreamt of a certain glass of water. This when followed up brought out a history of disappointed affection. The physical pain was a " transference " from intense mental suffering. A lady, aged twenty-three, had pain in the left arm which was somewhat similar in origin to the preceding. A girl, aged twenty-one, had a dread of church or going about alone in the street. This was traced to fright obtained when reading a book in which a person suddenly went mad.

He claims that hypnotic suggestion greatly shortens the time required in making an analysis, but is satisfied that " suggestion is of no use unless directed against the subconscious morbid idea." It should be noted that Freud and almost all his followers do not advocate the use of hypnotism in psycho-analysis.

Coriat,[9] in a contribution to the psycho-pathology of hysteria, relates a case. A lady, aged thirty, with symptoms of exhaustion, insomnia, depression, feeling of unworthiness, attacks of anxiety, hypnogogic hallucinations, and " nocturnal paralysis." Besides the usual methods of dream analysis and word association, the pulse reaction was taken, and a rise in the pulse-rate immediately appeared when an emotional complex was touched upon. It was elicited that the specific memories first dated from her fifth year, and were reinforced with incidents occurring in her eighth year.

He concludes as follows : " The value of the analytic method lies in the fact that one is able to discover suppressed material, and thus establish a definite psychological connection between symptoms and repressed experiences, a real continuity in the psychic series." . . . " It is extremely doubtful, however, after a suppressed complex has become automatic, if this complex is deprived of its baleful influence after it has been brought to the surface and the subject faces the mental conflict which had been previously avoided by repression."

Binswanger[10] describes in detail the analysis of a case of hysterical phobia. The patient, a girl aged twenty, for fifteen years suffered from attacks of faintness and acute distress whenever she saw the heel of a boot torn off. With the exception of obstinate constipation there were no other physical symptoms. The analysis lasted 178 days and continued for some time afterwards. With the exception that in the early stages hypnotism was employed, Freud's methods were used, and disclosed a history of masturbation in childhood with which the heel of a shoe was connected. Many other complexes were elicited. Two years after the end of the treatment she is reported to be perfectly well and to have forgotten almost everything connected with the matter.

Maeder[11] successfully treated a farmer, forty-two years old, suffering from melancholic depression. He had no pleasure in work, felt himself disgraced and an unworthy father, was suicidal, with loss of weight. The disorder had lasted one and a half years, and he was twice under restraint. He came voluntarily to Jung's polyclinic for treatment. The association experiments disclosed aversion towards his wife, with homo-sexual tendencies. After four analytical sittings the oppression and unrest disappeared. Six months later he remained well, with only now and then dull days. The case is stated to be a true melancholic depression, which apparently was founded upon a certain degree of homo-sexuality occurring in a patient with marked hereditary taint.

The *difficulties* which arise in relation to psycho-analysis as a method of treatment are serious.

The Time and Trouble involved.—The analysis of many of the cases that have been published has taken more than a year, and some of Freud's cases two, three, or even four years.[12] Although Ernest Jones[2] claims that the time required compares favourably with that necessary for the sanatorium treatment of tuberculosis, it is evident that a simple case of psycho-analysis requires an extraordinary amount of individual attention on the part of the physician. Thus, in the cases previously mentioned, Frink took three months. Binswanger required 187 sittings on separate days. It is not merely a question of time, but the amount of personal intellectual effort required of the medical man. Hence the practical question arises, How is it possible to provide treatment of this kind for those who are not wealthy, unless the physician takes the case up as a matter of scientific interest? It would seem clear that if psycho-analysis is to be generally useful, some simplification of technique must be discovered. As it is, the methods in use require so much special study and experience as to place the treatment out of the reach of the general practitioner.

The nature of the investigation is almost invariably unpleasant. Freud and his pupils find that the analysis reveals sexual complexes in every patient suffering from a psycho-neurosis. To quote Ernest Jones, "No one who has conscientiously and, free from all prejudice, explored the dark regions of the mind where neurotic symptoms arise, has any doubt about their essentially sexual nature."

He quotes Freud, who says, " I can only repeat afresh the principle which I have never found otherwise than true, that sexuality in the main is the key to the problems of both the psychoneuroses and the neuroses. He who disdains to use it will never be in a position to solve them. I am still awaiting the researches which will limit or upset this principle."

Jones continues, " The words were written six years ago, and others besides Freud are still waiting. Those who have learned the importance of the sexual factors in the neuroses have also come to realize that this fact is not so surprising as it at first appears, for they have learned that the stream that we call the sexual instinct is much broader and deeper than is commonly supposed. From it is evidently derived the main impetus that gives rise to artistic, literary, and poetic productions, and far more of our daily interests and ambitions than we superficially imagine are in reality sublimations from deeper and ultimately sexual sources."

In spite of this, the critic will seriously doubt the wisdom of endeavouring to elicit these past memories in order to open up long-forgotten sexual experiences and re-awaken lewd thoughts and phantasies. The analysis related by Frink dealt with a whole series of sexual topics of the most unpleasant nature, and even if the analysis truthfully explains the evolution of the symptoms, it is clear that for both the patient and the physician the discussion in detail of such matters over many weeks has many objectionable features. Seeing that the majority of patients are young women, this aspect of the matter is not without importance. It is obvious to anyone who reads the details of these investigations, that the physician is in a difficult and delicate position, and that psycho-analysis must not be attempted except under the most favourable conditions.

In Binswanger's case the reader will question whether the numerous complexes elicited were not largely the result of suggestion, and that the patient unconsciously exaggerated and distorted her childish experiences. The possibility of pseudo-reminiscence in such cases must never be overlooked.

The third line of criticism raises the question *whether the results obtained are really due to the method of treatment employed.* With regard to the statement that the recoveries are merely the result of suggestion, Jones[13] says: " Like the great majority of the Freud school, I had practised hypnotism before I learnt the psycho-analytic method, and I know indubitably that I am quite unable by the use of any other form of treatment to obtain the results this method gives me. It would be absurd to infer that suggestion is the influence at work in both instances, and that it is more successful when it is deliberately observed and neutralized than when it is the sole method of treatment."

It must not be forgotten that many psychasthenic and neurotic patients improve or recover without any special treatment. They provide the majority of " cures " by faith-healing, osteopathy, and the like. Every physician will call to mind patients who have recovered

in a surprising way. Craig,[14] in an article dealing with faith-healing and modern medicine, refers to this point, and moreover speaks of psycho-analysis as being often unsatisfactory. On the other hand, its devotees speak with no uncertain voice. Frink[4] says, " I have yet to see in the literature the report of a failure after complete analysis of a psycho-neurosis. The advocates of psycho-analysis do not claim that the method is a panacea for psycho-neurotic disorders. All are willing to admit that there are cases which for various reasons cannot be analyzed. It is claimed, and justly I think, that the method is one that from the point of view of results surpasses all other methods in the treatment of the psycho-neuroses, and it is hardly fair, either to the profession or the neurotics, that conclusions as to its therapeutic value should be drawn from failures that are obviously due to faulty technique."

J. A. Ormerod[15] critically reviews Freud's teaching and throws doubt upon the value of treatment by psycho-analysis. In particular the sexual theory of hysterical symptoms is attacked, which he considered to be " theory in excelsis."

" Can we suppose that every severe and ingrained hysterical symptom would be cured in this way? About the so-called process of 'conversion,' which is really one of the key-stones of their theory, one would like some independent proof. Is there really evidence to show that hysterical patients possess a peculiar faculty, whereby they can substitute a bodily symptom for mental distress? There is the same lack of evidence for the statement . . . that the ideas at the bottom of hysteria are always of a sexual nature . . . I know the answer made is that the proof of these statements lies in the so-called facts of psycho-analysis. But can we implicitly rely upon the dreamy imaginings of a patient undergoing this process? Is it not very probable that we may put into his mind just what we want to find there? We know that Freud gave up that portion of his theory which relates to sexual assaults, because he found his patients had misled him. And if the master of this method may be deceived, how much more his disciples? To this I cannot help adding that pseudo-analysis, if it is to mean the resurrection of buried sexual ideas, might to many patients do much more harm than good. The proof of the pudding, we are reminded, is in the eating; but the dish is a little unsavoury, and I cannot help hoping that the taste for it will not become general."

The critic cannot but remember the fate of many novelties in medicine that in their day were considered of the utmost value; although at the same time we may admit that " most of us have a much more limited capacity than we flatter ourselves to have of assimilating new thought," and that " mankind has a bad ear for new music." But whatever doubts we may entertain as to psycho-analysis as a means of treatment, there is little room for doubt as to its value in throwing light upon the evolution of symptoms and the pathogenesis of the neuroses. Making full allowance for erroneous reminiscences of patients, which indeed must often occur in dealing with incidents in early childhood, it is now quite clear that the psychical history

of the patient is a matter of extreme importance if the nature of the malady is to be understood. The work of Freud undoubtedly demonstrates that certain forms of mental disorder may arise solely from psychical disturbances, a view of their etiology which has in recent years been overshadowed by the opinion that toxæmic changes were of paramount importance.

REFERENCES.—[1]*Brain*, 1911, Jan.; [2]*Amer. Jour. Med. Sci.* 1911, July; [3]*Jour. Ment. Sci.* 1911, 458; [4]*Jour. Abnorm. Psychol.* 1911, 185; [5]*Ibid*, 209; [6]*School Hyg.* 1911, July and Aug.; [7]*Jahrb. f. Psychanal. Forsch.* 1910; [8]*Brit. Med. Jour.* 1911, Aug. 11; [9]*Jour. Abnorm. Psychol.* 1911, 33; [10]*Jahrb. f. Psychanal. u. Psycho-path. Forsch.* iii, 229; [11]*Ibid.* 479; [12]*Brit. Med. Jour.* 1910, ii, 1627; [13]*Jour. Abnorm. Psychol.* v, 5; [14]*Guy's Hosp. Gaz.* 1910, Nov.; [15]*Brain*, 1911, Jan.

PUDENDUM, GRANULOMA OF. *Leonard Rogers, M.D., F.R.C.P.*

ETIOLOGY. — R. Markham Carter[1] has examined six cases of ulcerating granuloma of the pudendum. In sections stained by Giemsa's solution, very large mononuclear cells are seen containing from 15 to 50 bean-shaped protozoal parasites very similar to Leishman bodies as seen in oriental sores. No flagellum has been noticed, but it is possible that it may be obtained by cultural methods. He thinks the disease is not venereal in origin, as it not rarely affects parts other than the genital organs. [Protozoal parasites were described by Donovan as occurring in Madras cases several years ago. —L. R.] Cecil L. Strangman[2] has investigated 34 cases of this disease in the Northern Territory of Queensland, where it occurs among the aboriginal inhabitants. In the unopened granulomatous tissues, acid-fast clusters of spherical bodies, similar to the coccus-like bodies found in botryomyces, are found, together with large round cells. Four to sixteen minute flattened discs from about 1μ in diameter up to four or five times that size are seen. They stain well with aniline dyes. With Leishman's stain, oval or slightly curved forms are seen. In the old lesions with suppuration, these protozoal parasites are more scanty. In aerobic cultures in the water of condensation of Loeffler's medium, by the fifth day club-shaped bodies of the clostridia type with one central and two terminal endospores develop, resembling the coccus-like clusters seen in sections. J. B. McLean[3] describes cases of the disease seen in Brisbane. He thinks the usual method of infection is venereal, but may also be by accidental inoculation. It is seen in aboriginals, and in whites only if they have cohabited with them.

TREATMENT. — McLean has successfully used **Paquelin's Cautery** under an anæsthetic, repeated operations being necessary. **X-rays** are also worthy of trial, as marked success has attended their use in Madras. E. Sandford Jackson[4] also records his experience of this disease in Brisbane, having used in its treatment with some success **Nitric Acid** (which is very painful) and the cautery. He agrees with McLean regarding the etiology of the disease.

REFERENCES.—[1]*Lancet*, 1909, Oct. 15; [2]*Austral. Med. Gaz.* 1911, 76; [3]*Ibid.* 1911, 137; [4]*Ibid.*

PUERPERAL STATE, DISORDERS OF.

Victor Bonney, M.S., M.D., B.Sc., F.R.C.S.

Puerperal Infections—Blair Bell[1] reports a case of septic thrombophlebitis of the pelvic veins successfully treated by ligature of the veins. He briefly reviews the pathology of the condition. Lenharz found in 60 fatal cases of puerperal infection 32 in which thrombophlebitis was the only gross lesion, while Trendelenburg, in 43 fatal cases, found the lethal condition due to thrombophlebitis in 22. Blair Bell states that, if these figures be true, about one woman in every thousand delivered in England and Wales dies of this condition. He himself holds that if the diagnosis can be made sufficiently early all these cases should be operated upon. Lea has collected between 50 and 60 cases so operated upon, with a mortality of 38 per cent, which is a good result seeing that in most there was a severe type of infection. For this reason Blair Bell believes that the operation will become the routine one in cases of puerperal sepsis.

In regard to the important question of *diagnosis*, he points out that the history is usually very suggestive. There is a period of moderate fever and symptoms lasting up to about the tenth day or later, when a sudden exacerbation of all the clinical signs takes place, not infrequently as the result of instrumental curettement. Rigors occur, there is little or no discharge from the uterus, and the case terminates rapidly with symptoms of acute septicæmia.

Vaginal Douching. — Burckhardt and Kolb[2] have compared the morbidity in cases in which vaginal douching was employed as a routine measure in the puerperium, with those in which it was not employed. They found that the morbidity was considerably greater in the undouched series. They found by bacteriological investigation that the vaginal douching definitely causes a diminution or disappearance of bacteria from the passage. They have been using a substance chlor-m-cresol for douching, which is powerfully antiseptic, only slightly affected by albuminous fluids, and perfectly harmless to the vaginal mucosa.

The publication of this paper is welcome. For a good many years now the dogma of "no douching in the puerperium" has been preached with parrot-like persistence by certain authorities. Nevertheless, the rationale of frequent washing out with an antiseptic solution of a passage containing a quantity of putrefiable fluid (blood) is strictly surgical, and is accepted in the case of every other accessible cavity except the vagina.

References.—[1]*Pract.* 1911, 178; [2]*Zeits. f. Geb. u. Gyn.* lxviii, Pt. 1, and *Brit. Jour. Obst. and Gyn.* xx, Pt. 1.

PULMONARY ŒDEMA. *J. J. Perkins, M.B., F.R.C.P.*

Symptoms. — Stengel,[1] describing *paroxysmal pulmonary œdema*, gives as the main features of the condition, sudden onset, usually with slight provocation, the evidence on examination of intense pulmonary œdema, the expectoration of quantities of frothy and blood-stained serum, and the repetition of such attacks without intercurrent complicating conditions. These features distinguish the condition he describes

from certain other forms of acute pulmonary œdema, namely, that associated with other lesions of the lungs, such as tuberculosis; acute infectious œdema, or serous pneumonia resulting from bacterial invasion, and the acute œdema accompanying rapid dilatation of the heart. The condition of the patient in an attack of paroxysmal pulmonary œdema is one of intense oppression of breathing, with pallor, sweating, and cyanosis. The pulse is usually weak and rapid, but occasionally gives no evidence of reduced cardiac power. At the onset a little frothy and blood-tinged serous fluid is brought up, while later larger quantities of the same sort of expectoration may literally well up from the lung. These seizures come on as a rule in the evening or during sleep, and are sometimes preceded by vague apprehensions, or may be provoked by physical or mental excitement, but generally there is no such cause. Such attacks may be repeated for a period of months and years. In Lissaman's case there were seventy-two attacks in two years, and in one of Stengel's cases paroxysms have occurred at intervals of weeks or months for the last ten years. The patients have generally suffered from persistent high arterial tension and increasing myocardial weakness, without evidence of renal disease, in some cases at any rate.

Etiology.—Stengel accepts in explanation the view of Welch, that acute pulmonary œdema may be caused by mechanical congestion of the lungs, the result of disproportion between the work of the right and left ventricles, though he does not deny that increased permeability of the pulmonary vessels due to toxæmia may be a subsidiary cause. Welch has shown experimentally that acute œdema arises when the left ventricle in rabbits is squeezed and thus partially paralyzed, the left heart under these circumstances being unable to expel in a unit of time the same quantity of blood as the right heart.

Treatment.—In Stengel's extensive experience of this condition, **Morphine** hardly ever fails when given at the very onset of the attack, his usual plan being to instruct the nurse in charge to give **Morphia** gr. $\frac{1}{4}$ hypodermically, followed by **Strychnine** gr. $\frac{1}{20}$, and **Nitroglycerin** gr. $\frac{1}{100}$ in ten or fifteen minutes, and **Morphia** gr. $\frac{1}{8}$ after half an hour if necessary. He thinks that the addition of a small quantity of **Atropine** to the morphine has a slight advantage over the use of morphia alone, but the morphia and not the atropine is the effective agent. When, if ever, morphia fails, **Chloroform** must be resorted to, as Lissaman in his remarkable case found that he could control the attacks in a very short time by this means, and that within ten to thirty minutes the patient gained complete relief.

Reference.—[1]*Amer. Jour. Med. Sci.* 1911, Jan.

PYLORUS, CONGENITAL HYPERTROPHY OF.

G. F. Still, M.D., F.R.C.P.

Hutchison[1] points out that this condition is certainly no new one, and therefore must have been overlooked by pathologists, as well as by clinicians, hitherto. On the other hand, Coutts[2] mentions that during

a dozen years only three cases were recorded at Shadwell Children's Hospital. He states, however, that during a subsequent six months some half-dozen cases occurred there.

Recently, much confusion has been introduced into the subject of pyloric stenosis by assuming that there are two distinct disorders, hypertrophy and spasm of the pylorus. Of the existence of any such varieties no satisfactory evidence has been adduced. Perhaps the weakest ground upon which the distinction has been made has been the effect of treatment. It has been assumed that because some recovered with medical treatment alone, therefore these could not be identical in their pathology with others in which great thickening of the pylorus was associated with obstruction yielding only to operation. The falsity of this assumption has been proved by abundant clinical observation, and the distinction has no basis of morbid anatomy; nor is it possible upon any clinical grounds, for cases which recover under medical treatment are entirely undistinguishable in regard to signs and symptoms from those which require operative treatment.

Symptoms.—Hutchison[1] recalls the now familiar fact that congenital hypertrophy of the pylorus occurs far more often in boys (80 per cent) than in girls. It also occurs with extraordinary predominance in firstborn children. The most prominent symptom is persistent vomiting, which, however, rarely begins before the second to fourth week after birth. The vomiting is often "projectile," and more is brought up than was taken at the last meal. It consists sooner or later of mucus as well as food, occasionally with some blood. Constipation is also a prominent feature. This is probably due simply to failure of the food to find its way into the bowel at all. Wasting is, as might be expected, an invariable accompaniment of these symptoms.

Physical Signs.—There are three, according to Hutchison: (1) Dilatation of the stomach, sometimes visible by the prominence of the epigastrium, and generally to be determined by percussion; (2) Visible gastric peristalsis, i.e., waves, each about the size of a golf ball, passing slowly across the epigastrium from left to right, three of which may be visible at one time, and best seen just after a feed; (3) Palpable pyloric tumour. Marsh[3] mentions that he felt the pylorus distinctly in four cases out of six. Coutts, on the other hand, felt it only in two out of six.

Prognosis.—Hutchison considers that the mortality depends very much upon the line of treatment adopted. He mentions recovery under medical treatment in 18 out of 20 cases, whilst Heubner records 19 recoveries out of 21, Starck 11 out of 12, and Bendix 30 out of 32. On the other hand, Ibrahim's estimate of 50 per cent mortality amongst cases submitted to operation is probably near the truth, though, as Hutchison admits, operation in many cases is only performed as a last resort, when the chances of recovery are necessarily small.

Treatment.—The remarkable effect of **Daily Lavage** of the stomach in these cases has now become widely recognized. It should be done

once or twice a day, according to the frequency of the vomiting. Heubner, however, considers even lavage unnecessary. With the lavage must be combined careful **Feeding,** if possible with breast-milk given in small quantities at frequent intervals, for which purpose it is necessary to draw it off and give it by spoon. Under these conditions, however, the breast-milk usually fails rapidly, and artificial feeding becomes a necessity. Hutchison recommends peptonized and diluted cow's milk as the best substitute. He does not think it necessary to exclude fats. Coutts mentions a case in which an infant gained weight well on whey and glidine, though operation ultimately became necessary. If the vomiting be severe, it may be necessary to give food also by rectum. Continuous **Poulticing** to the epigastrium has been found of some value in Germany.

Most observers are agreed that *drugs* are of almost no value in this condition ; alkalies have been given upon the assumption that there is hyperacidity of the gastric contents. The only drug which has received any wide support is **Opium.** This was recommended some years ago by Neild, of Bristol. Hutchison recommends tinct. opii min. $\frac{1}{20}$ before each feed, which sometimes helps to diminish vomiting, besides allaying restlessness and promoting sleep. Whatever line of medical treatment is adopted, progress is likely to be very slow. The infant may even continue to lose weight for a time, and there may be little or no progress for many weeks, sometimes not until the fifth month. With perseverance, however, improvement eventually comes ; and, as Hutchison points out, is sometimes sudden in its commencement.

Surgical Treatment.—The alternative to such medical measures as have been described is **Laparotomy,** with some method either of widening the pyloric orifice or of short-circuiting by anastomosis between the stomach and the bowel. Nicol[4] considers that the best operation is a combination of gastro-enterostomy with pyloroplasty or divulsion. It is difficult to understand why divulsion or pyloroplasty should be done in addition to gastro-enterostomy, as there is abundance of evidence that either pyloroplasty or divulsion is an effective method of treatment by itself. Nicol also recommends appendicostomy as a preliminary measure in extremely feeble infants. It is hard to see what useful purpose this addition to the severe operation necessary for an infant enfeebled by pyloric stenosis could possibly serve. Coombe[5] favours pyloroplasty. He considers that divulsion is "a leap in the dark," and not "consonant with modern surgical procedures and knowledge." [Some of the best series of results of operation have, however, been with divulsion.—G. F. S.] Scudder[6] reports three successful cases of gastrojejunostomy, being a second series of three consecutive recoveries with this operation. This writer recommends laparotomy as a method of diagnosis in "doubtful" cases of pyloric stenosis. Such a procedure ought never to be necessary, as even in the rare cases where the affection cannot be recognized at a first examination, it can invariably be diagnosed without difficulty by examining on two or three occasions. It is one of those conditions

which any experienced physician can recognize with certainty, as the conspicuous gastric peristalsis and palpable tumour offer no possibility of mistake.

References.—[1]*Brit. Med. Jour.* 1910, ii, 1021; [2]*W. Lond. Med.-Chir. Jour.* 1910, 304; [3]*Liverp. Med.-Chir. Jour.* 1911, 104; [4]*Pract.* 1910, ii, 659; [5]*Ann. Surg.* 1911, ii, 167; [6]*Bost. Med. and Surg. Jour.* 1910, Sept. 15.

PYORRHŒA ALVEOLARIS.

(*Vol.* 1911, *p.* 548)—**Extraction** of the teeth is the safest plan. Short of this, cleansing of the infected surfaces by a solution of **Citric Acid** in 2½ per cent **Carbolic Acid** is very effective. **Vaccines** are useful.

PYREXIA OF UNCERTAIN ORIGIN. *Leonard Rogers, M.D., F.R.C.P.*

G. E. Stewart[1] describes, under this term (which is now officially recognized), an epidemic occurring at Poona in Western India, among the men of one of three native regiments occupying closely contiguous lines of huts. It commenced late in September and affected 25 per cent of the regiment. The duration of the pyrexia was usually too long for phlebotomus fever, while sand-flies were not prevalent at the time. He considered that the disease most closely resembled seven-day fever, although in many cases the pyrexia did not last as long; but admits it was frequently difficult to ascertain the day of onset accurately. The charts closely resemble those of seven-day fever, so it appears that this disease may produce epidemics inland in the Bombay Presidency as well as on the coast.

Reference.—[1]*Ind. Med. Gaz.* 1911, 201.

RECTUM, DISEASES OF. (*See also* Hæmorrhoids).

Sir Charles Ball, M.Ch., F.R.C.S.

As pointed out by Hartmann (*Medical Annual*, 1911, p. 551), there is an important difference between the blood-supply of the rectum proper and the pelvic colon; in the former, the vessel is terminal and the anastomosis between its branches very slight, whereas in the latter, tolerably large anastomotic loops join the branches of the artery supplying the pelvic colon, shortly before they penetrate the bowel, the last of these communicating loops being a little below the sacral prominence. As the course pursued by the superior hæmorrhoidal artery is directly downwards, the rectum is suspended by the vessel and surrounding tissue, and in order to bring down the upper portion to the anus after excision of the rectum, the artery is of necessity divided, and if the route selected is either the perineal or sacral, this division must be at a point below the last communicating loop. Consequently there is a grave danger of necrosis, and clinical experience demonstrates that sloughing is of frequent occurrence in these cases; if, however, the superior hæmorrhoidal artery is divided by the abdominal route above the last communicating branch, the vitality of the bowel is provided for when it is subsequently drawn down. The importance of these observations has given rise to further anatomical investigations. Davis[1] adopts the term "critical point," used by

PLATE XXX.

BLOOD SUPPLY OF THE RECTUM

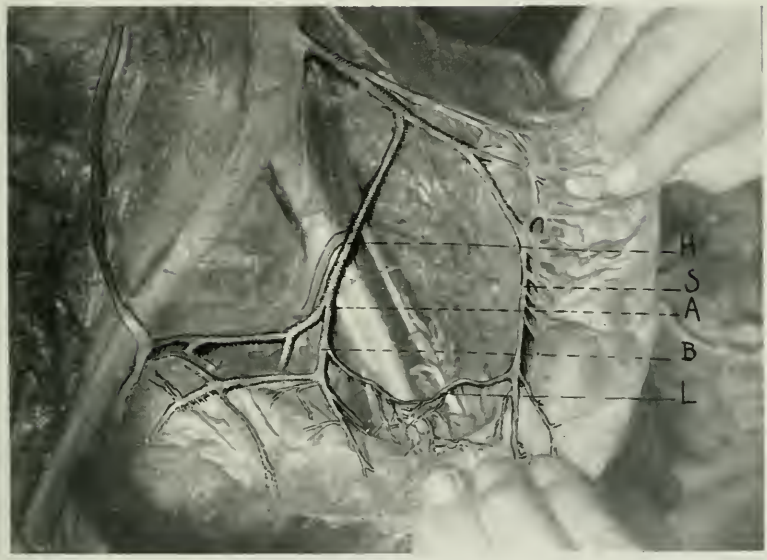

Fig. A.—A. critical point; B. too low to supply entire rectal system; S. sigmoid; H. sup. hæm. artery; L. loop anastomosing with sup. hæm. artery below bifurcation.

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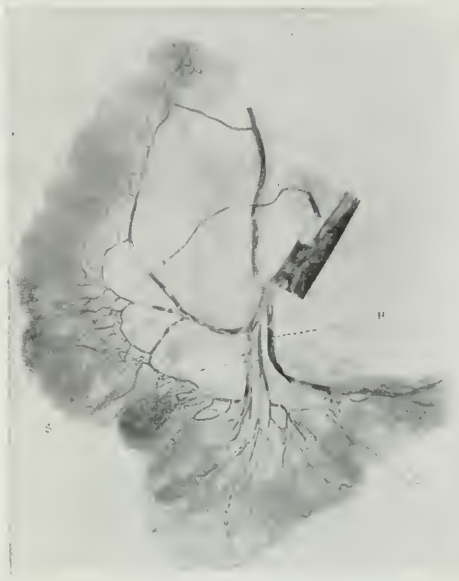

Fig. B.—S, sigmoidal arteries; H, sup. hæm. artery; L, no well-developed loop present.

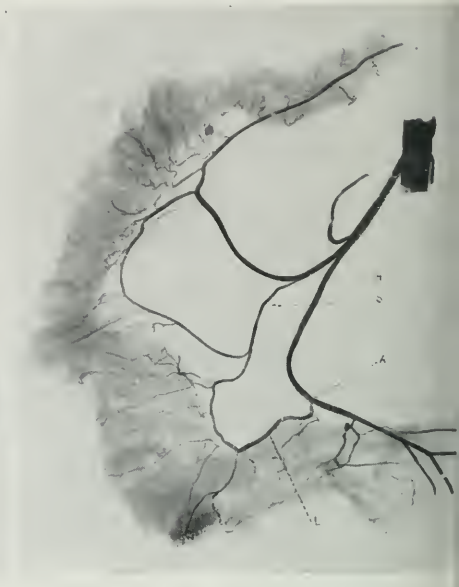

Fig. C.—A, critical point; S, sigmoidal artery; H, sup. hæm. artery; L, loop lies close to bowel.

Fig. D.—A, critical point; S, sigmoidal artery; H, sup. hæm. artery; L, loop lies close to bowel.

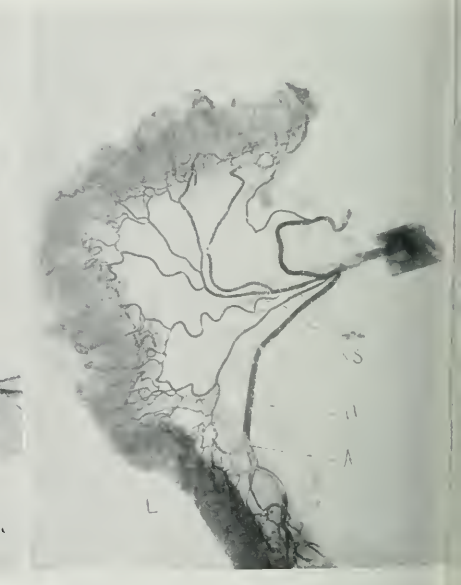

Fig. E.—A, critical point; S, sigmoidal arteries; H sup. hæm. artery; L, loop close to bowel.

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PLATE XXXII.

BLOOD SUPPLY OF THE RECTUM—*continued*

Fig. F.—A, critical point; S, sigmoidal vessels; H, sup. hæm. arteries, bifurcation proximal to anastomosis; L, loops double, distant from bowel.

Fig. G.—A, critical point; S, sigmoidal artery; H, sup. hæm. artery; L, loop.

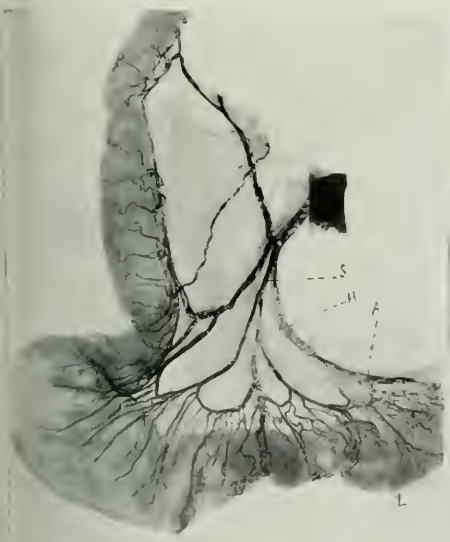

Fig. H.—A, critical point; S, sigmoidal artery; H, sup. hæm. arteries; L, double loop.

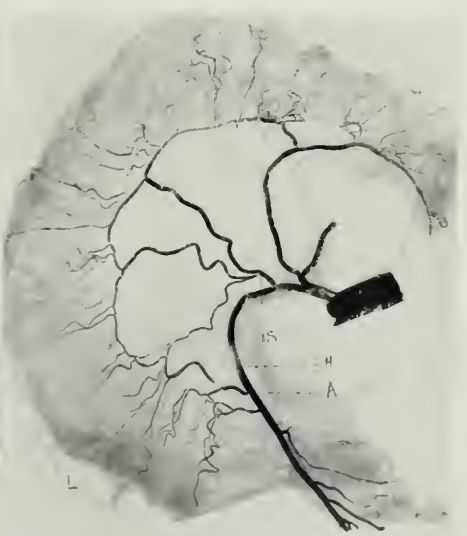

Fig. I.—A, critical point; S, sigmoidal artery; H, sup. hæm. artery; L, loop.

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Sudeck, to indicate the position of the last communicating loop between the sigmoid and superior hæmorrhoidal arteries. He states that variations in the rectosigmoidal anastomosis are common. With the view of determining the frequency and nature of these variations, and the relation of the vessels entering the anastomosis to the bowel wall and to each other, he has examined twenty-one subjects. Reproductions of some of these results appear in *Plates XXX, XXXI, XXXII.* The vessels had been injected with a starch mass containing lead oxide. In some cases the vessels were dissected out to the bowel wall, while in others the relationship of the vascular loop was determined by *x*-ray pictures.

Three of the subjects were females. These showed no variations which can be considered peculiar to the sex. A definite, well-developed loop was absent in two cases (*Fig. B*). In these instance ligation of the superior hæmorrhoidal artery at any point would probably have resulted in gangrene, as the vascular anastomosis within the wall of the bowel would not furnish enough blood. After resection of the rectum for a high-lying carcinoma in such cases, it would be safest to draw the proximal end of the rectum or sigmoid out through the abdominal wall and form an iliac anus. The loop varied in calibre from an artery as large as the vessels it connected, to a mere thread-like vessel in one instance. The loop was found on an average 1·5 cm. below the level of the promontory of the sacrum (*Fig. A*). In one subject, however, the loop was found 5 cm. below the promontory. The anastomosis was found at a varying distance from the bowel. The rule of clamping the vessels as far back from the rectum as possible, to avoid injury to the blood-supply when operating by the sacral route, results in missing the loop when it lies close to the bowel, as in *Figs. C, D,* and *E.* With relations as shown in *Fig. F,* on the other hand, there would be great danger of catching some portion of the loop, because it arises so far from the bowel. After occlusion of the vessels, gangrene of the stump usually occurs in greater or less extent, the fæces escape into the wound, and if infection reaches the peritoneal cavity, the patient dies of peritonitis.

In several instances the bifurcation of the superior hæmorrhoidal artery occurred before the sigmoidal loop joined the rectal supply (*Figs. A* and *E*). In most of these cases the sigmoidal branch joined with the upper division of the hæmorrhoidal artery; in two cases, however, it anastomosed with the lower division. In these instances ligation immediately above the junction of the sigmoidal loop (*Fig. A*, B) would be dangerous, and should be performed above the point of division of the superior hæmorrhoidal artery (*Fig. A*, A). This division is variable (*Figs. D* and *E*), the length of the main artery varying from 2 cm. (*Figs. A* and *E*) to 6 cm. (*Fig. G*). In some instances this artery passes down as a single trunk from the inferior mesenteric artery to its subdivision upon the rectum (*Figs. D, H,* and *I*).

Section of the superior hæmorrhoidal artery above would permit of mobilization of a considerable length of the sigmoid (*Figs. A, C,* and *I*).

With a condition as shown in *Fig. G*, section of the hæmorrhoidal artery and the small division of the sigmoidal artery would give ample movement to the sigmoid colon ; but with a vascular system as pictured in *Figs. B, D, F, G*, and *H*, several large trunks would have to be sacrificed to obtain any marked descent of the sigmoid.

Conclusions.—Of 21 subjects examined, loop was present in 19 cases ; superior hæmorrhoidal artery bifurcated before junction with loop, seven cases ; loop anastomosed with lower division in two cases. The lowest loop was found in one subject with the critical point almost in the bottom of the cul-de-sac of Douglas. A vast majority of the other cases showed the loop about 1·5 cm. beneath the promontory of the sacrum. Sixteen subjects showed the loop close to the bowel. Five subjects showed the anastomosis formed by large loops at a distance from the bowel.

1. Following high resection of the rectum, gangrene of the stump can be avoided by ligation of the superior hæmorrhoidal artery proximal to the point of entrance of the anastomotic loop from the sigmoidal artery.

2. Where high resection of the rectum is to be done by the sacral route, a preliminary abdominal incision is of value to determine the presence and location of the critical point, the relations of the superior hæmorrhoidal artery, and to permit of a definite placing of ligatures to check hæmorrhage.

3. The anastomotic loop is not present always. In these cases high resection of the rectum for carcinoma should be terminated with a permanent colostomy.

The *x*-ray pictures are printed as viewed from behind.

Direct Inspection of the Rectum and Sigmoid Colon. — Although the information to be derived from direct inspection of the upper rectum and pelvic colon is probably not so great as is sometimes claimed for the method, in occasional cases undoubtedly an efficient colonoscope is an important aid to diagnosis, and of the many patterns which have been invented, the one described by Beer[2] has several decided advantages. He describes it as follows :—

" The tube is 35 cm. long, each centimetre being marked off on its outer side up to 30. The ocular end is closed by a piece of plain glass fitted into the extension of the tube (light-carrier) by an airtight bayonet hinge. The light-carrier fits into the tube proper by a similar hinge, and the light is close to the rectal end of the tube. By virtue of this double hinge the glass can be removed, leaving the lamp *in situ*, and the applicators, forceps, etc., manipulated with the light burning. The calibre of the tube is smaller than that of the Kelly and many other instruments, and it can be used in most young patients (ten years old) as well as in adults. At the rectal end of the tube a rubber balloon is attached which can be distended to the requisite size, as required, by introducing air through one of the stopcocks near the ocular end from a graduated syringe. The object of this balloon is to produce local distention of the bowel at the point of inspection, and it is

frequently very effective in doing so. It is of use chiefly in the sigmoid, as in the rectum distention is almost always adequate. When this balloon is distended, air driven into the bowel from a hand bulb through the other stopcock frequently converts the sigmoid into a hollow viscus, which is very rarely the case without the use of the balloon. Moreover, it is of great assistance as a local retractor, straightening out the folds of the gut and exposing suspicious surfaces, as well as in opening up the path which the tube must follow. I usually employ a finger cot or a finger of a thin rubber operating-glove for the balloon, and use 75 to 100 c.c. of air for its distention in adults. Before using the instrument I test the balloon and determine how much air is required to produce a distention of 3 to 3½ cm. (1¼ to 1½ in.) in diameter, or a circumference of about 10 to 12 cm. (4 to 5 in.). *In ulcerative conditions I naturally avoid distending the gut for fear of rupturing its wall.* I have had no mishap of any sort with this instrument, and have frequently been astounded by the assistance it has offered and by the extension of the field of vision which I have

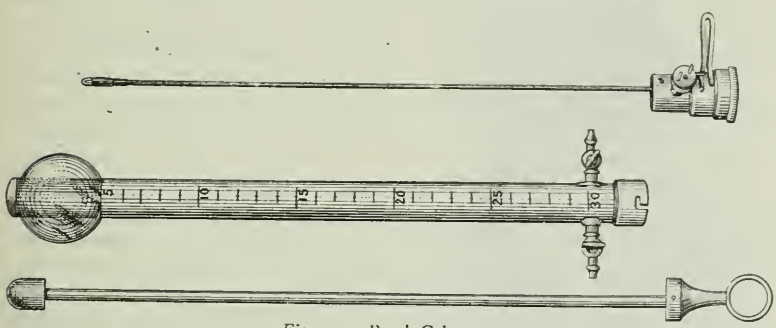

Fig. 103.—Beer's Colonoscope.

obtained by drawing the tube with distended balloon ¼ to ½ in. towards the anus while forcing air into the lumen of the gut. Any more extensive introduction or withdrawal of the tube with distended balloon is absolutely contraindicated. If such is desired, the balloon must be emptied preliminarily. After each use a fresh finger cot or finger must be applied to avoid carrying infection, as the rubber does not stand sterilization. Occasionally the balloon breaks *in situ* with an audible explosion. This shock, however, is so slight that no damage is done. Through the second stopcock, as stated above, air can be pumped slowly into the lumen of the bowel. Usually the patient expels any excess alongside of the tube.

"The metal obturator is grooved so that when it is withdrawn from the tube no suction is created, air rushing in along these grooves. All applicators and forceps should be made with handles at right angles to the shafts, so as not to permit the hand to obstruct the view of the parts touched."

References.—[1]*Ann. Surg.* 1910, 529; [2]*Med. Rec.* 1911, i, 243.

REFRACTION, ERRORS OF. *A. Hugh Thompson, M.D.*

Changes in Refraction.—This subject is very inadequately dealt with in most text-books, and it is often assumed that myopic eyes are the only ones in which the refraction tends to alter from year to year. In astigmatic eyes, however, a lengthening of the antero-posterior axis is apt to take place in children even before they are myopic, so that hypermetropic tends to pass into mixed astigmatism, and this again into the myopic variety, a process illustrated by a statistical study published some years ago by the writer.[1] Cases in which the amount of the astigmatism itself varies, apart from external pressure, operation, or disease, are generally supposed to be rare, except for the tendency in eyes of people past middle life to develop an inverse ("against the rule") astigmatism, which is generally assumed to be caused by lenticular changes, but which Savage[2] suggests is due to an altered relation in the plane of the lens to that of the cornea.

According to Zentmayer,[3] refractive change is common. He has analyzed the changes noted in 550 eyes from his records of private patients, almost all the patients having been examined under the influence of atropine or other cycloplegic, and having worn correcting glasses in the interval between the two examinations. 80 per cent of the eyes examined underwent a change either in the static refraction or in the amount of astigmatism. According to him, changes occur at all ages. "Astigmatism," he says, "is often acquired in hyperopic eyes, and as frequently in the third as in the fifth decade. Before the forty-fifth year the axis of the acquired astigmatism is as frequently with as against the rule, but after the forty-fifth year it is against the rule in 85 per cent of patients. . . . A change in the axis of astigmatism occurs in about 50 per cent of the cases."

In the discussion of this paper, Lambert referred to acquired astigmatism due to the pressure of a chalazion, and to the traction of an anterior synechia. Hiram Woods dwelt on the absolute necessity of complete cycloplegia during the tests before admitting the changes in refraction which were said to take place.

Operative Treatment of High Myopia.—Since this subject was last touched on in the *Medical Annual*,[4] the tendency has been to be more careful rather than bolder in the performance of the operation, mainly because of the danger of detachment of the retina. In addition to what was said then, the following points, taken from a paper published by the writer,[5] may be noted in deciding whether a case is suitable for operation or not: (1) The degree of myopia most likely to be changed into emmetropia is − 21 D, and the average change of refraction may be represented by the formula $\frac{M}{2} + 10{\cdot}5$, where M represents the degree of myopia before operation. Thus a myopic of − 16 D would probably become hypermetropic after operation to the extent of + 2·5 D. The result in any individual case, however, cannot be predicted to within a dioptre or two. (2) The tendency which exists in nearly all highly myopic eyes for the long axis of the eyeball to increase, does not seem to be affected one way or the other by opera-

tion, so that an eye which is left slightly hypermetropic after operation will probably tend to become emmetropic. (3) It is unwise to operate on an eye in which the myopia is complicated by disease. (4) It is unwise to operate on patients over thirty except in cases of myopia with cataract. (5) When the fellow eye is emmetropic, it is unnecessary to operate. Where it is seriously diseased, the risk of operating on the healthy eye is increased. Where one eye has already been operated on, it is probably wiser to leave the second eye untouched. (6) Favourable cases are young patients with myopia over – 16 D, with healthy vitreous and fundus, and a second eye also myopic but otherwise healthy.

Education of High Myopes.—One of the most pressing needs from the point of view of ocular hygiene is the establishment of special curricula for school children who, while not being suitable for a blind school, have sight that is not only very weak but also liable to be made worse as the result of ordinary school work. A paper of Harman's[6] describes a beginning made in this direction by the London County Council's establishment of special "myope classes." So far as oral teaching and handicraft go, these children join in the ordinary school curriculum, but the use of class books is forbidden. All reading and writing is done by the use of blackboards (*Fig.* 104), each child writing free-arm fashion on his own blackboard, and no reading being taught except by means of letters of such a size that a child with, say, $\frac{6}{24}$ vision can read them easily at a distance of two or three metres.

Fig. 104.—Harman's myope desk, in use as blackboard for literary work.

Eye-strain.—Hinshelwood[7] says that ocular headache may occupy any position—frontal, vertical, or occipital, and even at the back of the neck. Whilst the situation of the headache does not guide to the diagnosis, in the majority it is frontal or vertical. If the patient has had a good night's sleep he wakens up free from headache. It begins in the course of the day, and gradually increases in intensity as the day goes on. This is in contrast to the character of the toxic headache, which is worst in the morning after a good night's sleep, and becomes better when the patient gets up and exerts himself. In many cases of headache we have a combination of the toxic and ocular, and in such cases the patient wakens with a headache, which, however, gets worse as the day goes on. In such cases the cure of the patient can only be accomplished by the relief of the eye-strain and the removal of the toxæmia, of which constipation is a frequent cause. Anæmia and eye-strain are also a frequent combination in the production of

headache, and cure can only be brought about by the removal of eye-strain and the internal administration of drugs for the cure of the anæmia.

Where such symptoms exist, it is not sufficient to test the refraction roughly. The patient must be fully under the influence of an efficient mydriatic, and an accurate retinoscopy performed. It is often the case that minute errors of refraction, such as 0·25 D or 0·5 D of astigmatism, give rise to more distressing symptoms than more considerable errors. The reason is pointed out by Clarke:[8] "It is important to remember that it is not the error of refraction that causes the peripheral irritation, but the unconscious correction of the error by the patient. When the defect is great, no attempt is made to correct it, as the ciliary muscle can only correct low degrees of astigmatism; hence there is no eye-strain."

References.—[1]*Brit. Med. Jour.* 1906, July 28; [2]*Jour. Amer. Med. Assoc.* 1911, ii, 470; [3]*Ibid.* 474; [4]*Med. Ann.* 1910, 525; [5]*Brit. Med. Jour.* 1910, Oct. 29; [6]*Ibid.*; [7]*Lancet*, 1911, i, 429; [8]"Refraction of the Eye," 3rd ed. 157.

RELAPSING FEVER. (*See* Spirochætosis.)

RETINA. *A. Hugh Thompson, M.D.*

Maculocerebral Degeneration (Familial).—Oatman[1] has grouped together certain uncommon cases under this heading. The one constant characteristic is a degenerative process in the retinal macula, generally found in several members of the same "childship" but not in ancestors or descendants. In some of the cases described the affection begins about the age of six or seven, and is accompanied by a degeneration of the brain, so that the child, who is apparently normal up to the beginning of the second dentition, gradually becomes partially blind and imbecile. In other cases the brain is not affected, and in these the affection of sight does not apparently begin until about the time of puberty. In either form, whether the case belongs to the "maculocerebral" or to the "macular" type, the ophthalmoscopic changes found are very similar and symmetrical in the two eyes. The affection of vision commences with a central scotoma for colour which in advanced cases is absolute. Ultimately the discs become atrophic. There is no known connection with syphilis, tuberculosis, or any other dyscrasia. In some of the reported cases there has been consanguinity in the parents. This was so in the cases of a brother and sister, reported by Oatman, whose ophthalmoscopic pictures are reproduced here (*Plates XXXIII, XXXIV*). They were both normal children until the age of six, after which both sight and intellect gradually failed. There were four years between the two children, and a sister half-way between them was quite normal, being fourteen years old when the paper was published. It is worth noting that none of the cases yet published, either of the maculocerebral or of the macular type, have occurred in Jews, a fact which would seem definitely to differentiate the disease from *amaurotic family idiocy*, which appears to occur exclusively among Jews. Other cases of obscure macular disease found in early infancy are non-

FAMILIAL MACULOCEREBRAL DEGENERATION

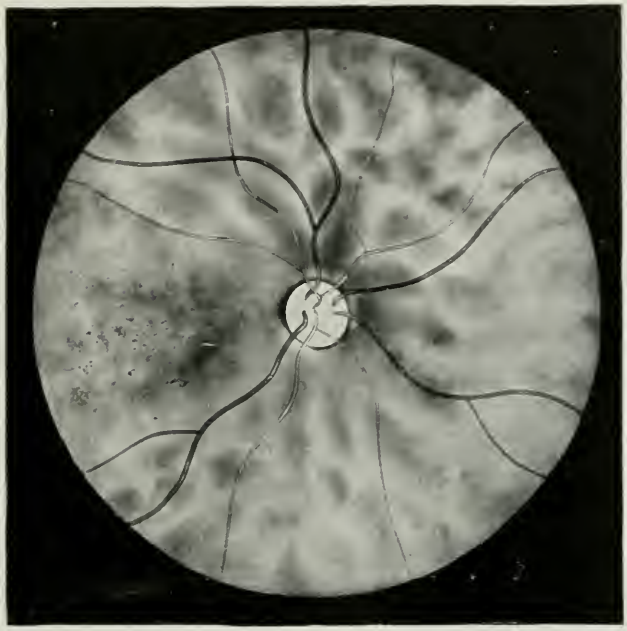

Fig. A.—Right eye of sister. Patient is a brunette, and the fundus, normally, is strongly tessellated. Of the four eyes described, macular degeneration is farthest advanced in this one.

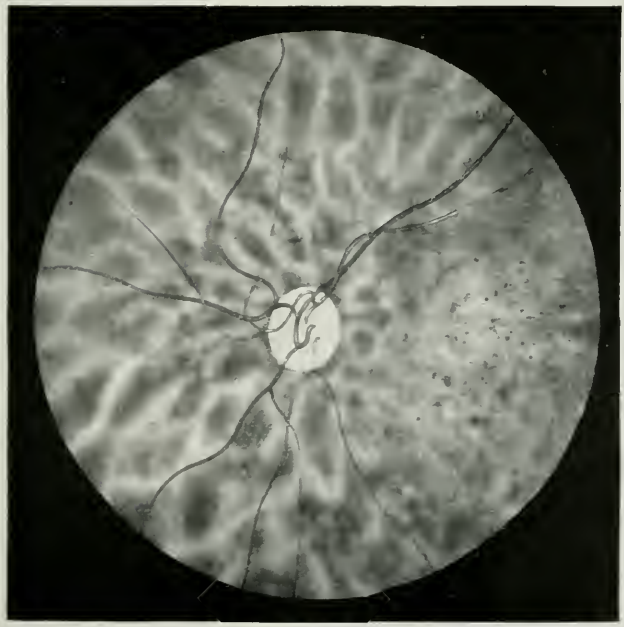

Fig. B.—Left eye of sister. Macular degeneration and thinning of pigment slightly less than in right eye. The configuration of macular changes is symmetrical in both eyes, although differing from that seen in brother's eyes.

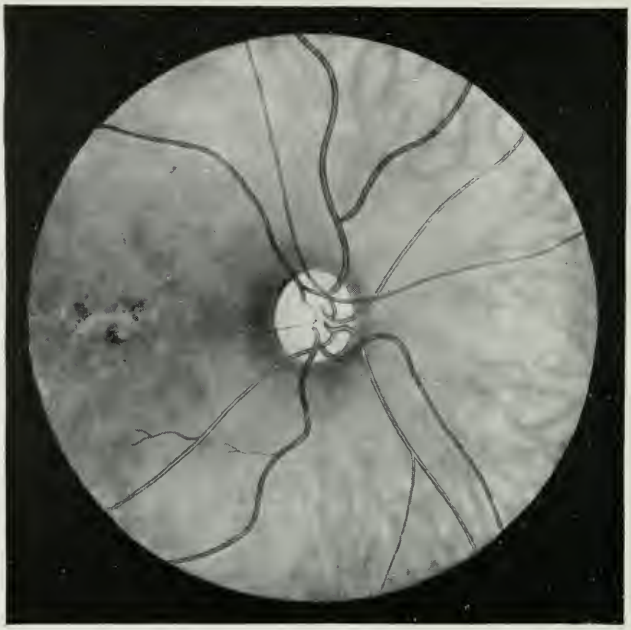

Fig. C.—Right eye of brother. This is the earliest stage of macular degeneration presented by any of the four eyes described in author's cases.

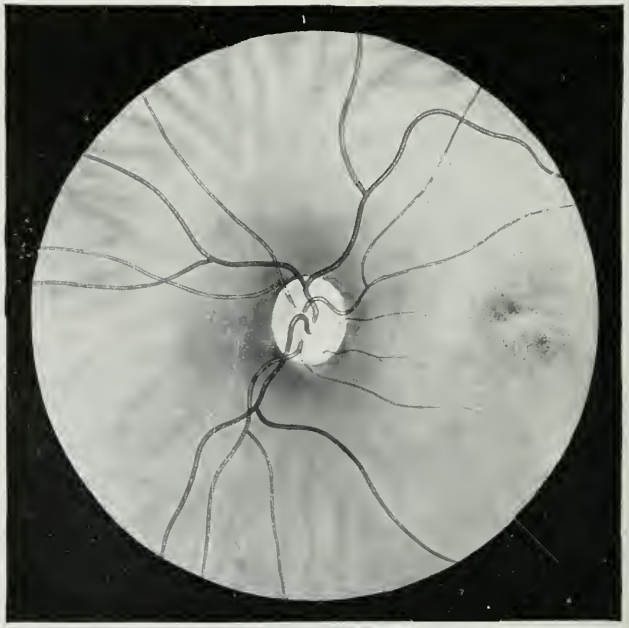

Fig. D.—Left eye of brother. Retinal atrophy is slightly more advanced than in right eye. The changes in the two eyes are remarkably symmetrical.

progressive, and not associated with imbecility or optic atrophy. These are distinctly hereditary, and are therefore different from the disease under consideration. The only other diseases with which it is likely to be confused are central choroiditis due to syphilis, tuberculosis, etc., and atypical retinitis pigmentosa, in which, however, the symptom of night blindness is always present, whereas in macular degeneration the sight is as good by night as by day, if not better.

Prognosis in Retinal Hæmorrhage.—It has long been known that the prospect of duration of life in cases of albuminuric retinitis is comparatively short. From a study of 187 cases occurring in private practice, by Rogers,[2] it appears that a very grave prognosis should be given in all cases of retinitis in which there are hæmorrhages. He finds that three-quarters of all such cases either terminate fatally within a few years, or the patients suffer marked impairment of health, and that its existence in any form is suggestive of present or future disease of the nervous or circulatory system. In cases of albuminuric retinitis, the younger the patient the worse the prognosis of duration of life. This does not apply to the albuminuric retinitis of pregnancy.

References.—[1]*Amer. Jour. Med. Sci.* 1911, ii, 221; [2]*Jour. Amer. Med. Assoc.* 1911, ii, 99.

RHEUMATISM.

Treated with **Atophan** (*pages* 7, 8); **Hydropyrin** (*page* 19); limitations of **Sodium Salicylate** in (*page* 37); **Radium** (*page* 80); emanations (*page* 84).

RHINOSPORIDIUM KINEALYI. *Leonard Rogers, M.D., F.R.C.P.*

A. C. Ingram[1] records three cases of this protozoal infection in Madras. In two there were tumours in the usual situation in the nose, and in one on the penis, where it formed a cauliflower-like growth of six years' duration, for which amputation was performed.

Reference.—[1]*Lancet*, 1910, Sept. 3.

RICKETS.

Phytin increases appetite in (*page* 33).

(*Vol.* 1909, *p.* 506)—**Olive Oil** is a good substitute for cod-liver oil when the latter cannot be borne. Soft-boiled eggs and scraped meat are good foods.

RINGWORM.

Mercury Colloid locally applied (*page* 25); **X-ray** treatment (*page* 74).

RINGWORM, TROPICAL. *Leonard Rogers, M.D., F.R.C.P.*

Aldo Castellani[1] records further work on tropical ringworm. Cultures were obtained from three cases, and two species of fungus found, one being the *Endodermophyton concentricum* (*Blanchard*), while the other the writer proposes to call *E. indicum*. Both can be experimentally produced in man from the cultures by inoculation. Coloured illustrations of the growths are given.

Reference.—[1]*Jour. Trop. Med. and Hyg.* 1911, 81.

RODENT ULCER.

Possibilities of cure with **Radium** (*pages* 79, 80).

RUBELLA. *E. W. Goodall, M.D.*

Clifford Beards and W. L. Goldie[1] give an account of 1,335 consecutive cases of rubella that have been under treatment at the London Fever Hospital since 1899. They conclude that the *incubation period* of the disease is from 14 to 16 days.

Etiology.—The seasonal prevalence is the spring and early summer. There were rather more males than females amongst the patients. Over 98 per cent were above ten years of age; whereas for measles, at the same hospital during the same period, 80 per cent were over ten years. [The difference in the age-incidence is, however, really much more marked than appears from these figures, owing to the special circumstances of the London Fever Hospital, into which institution a much larger proportion of adults than children are admitted. In other fever hospitals, as well as in the community generally in those towns in which notification of measles has been practised, the vast majority of the cases are under ten years.—E. W. G.]

They saw hardly any cases of *complications*; of 478 consecutive cases there were "rheumatic pains" in 2 and transitory albuminuria in 7. According to them, the period of invasion of the disease is usually short and mild. The chief symptoms at this stage are malaise, headache, sore-throat, coryza and sneezing. Vomiting is extremely rare. In 70 per cent of their cases there was adenitis for forty-eight hours or more before the appearance of the rash. The glands affected were nearly always the posterior auricular, more rarely the occipital, and occasionally the upper of the concatenate chain in the neck. "Even in the absence of any palpable enlargement, the patient often complains of 'stiff neck,' and tenderness is elicited on pressure over the upper part of the sternomastoid muscles. The adenitis is usually sufficiently noticeable to call for remark from the patient, and the tenderness is out of all proportion to the amount of the swelling." In most cases the glandular enlargement subsides as the rash fades, but in some cases may persist for several days.

These authors describe three varieties of the rash in rubella: (1) *Typical*, consisting of small, discrete, rose-red, slightly raised papules, appearing first on the face, later on the trunk and limbs. As the rash fades and the papules coalesce, the appearance of the erythema of scarlet fever is closely simulated. According to the authors "the punctate element is lacking, and the rash does not persist in the groins, axillæ, and flexures of the elbows, as is usually the case in scarlet fever." Usually the rash lasts for about seventy-two hours. (2) *Morbilliform*, in which the rash closely resembles on the face and limbs that of measles. On the extremities the rash assumes the typical appearance already mentioned. On the second day it often assumes the form next to be described. (3) *Scarlatiniform*. In this, the rash from the onset resembles that of scarlet fever, especially on the trunk,

but "the areas of unaffected skin are more numerous than in scarlet fever."

Concerning the condition of the mouth in this disease, the authors write as follows: "On the soft palate a macular eruption is not infrequently present, which occasionally involves the hard palate, but as a rule the sharp line of demarcation between the two is rather noticeable, due in many cases to the hard palate appearing paler than normal. On the soft palate we have on several occasions noticed a fine vesicular eruption, in which cases the background appears intensely red. On the buccal mucous membrane a few discrete pink papules may sometimes be seen, resembling those found on the cutaneous surface, but nothing in the nature of Koplik's spots is ever observed. We have, however, noticed small yellowish plaques, usually on the mucous membrane behind the last molar teeth of the lower jaw, to which Dr. Sidney Phillips has directed our attention; but as these are also occasionally present in morbilli and scarlet fever, they are of little value in diagnosis."

The temperature usually rises at the onset of the rash, and is at its highest point on the second day, after which it falls rapidly. It is seldom very high. Of over 450 cases, in only 14 was the temperature over 103° F., and the highest recorded in any case was 104° C. in a man aged 33 years. There are no distinctive points to be mentioned concerning the pulse or respiration. The only form of desquamation observed was the fine branny variety; it was usually limited to the face and chest. The authors have not been able to differentiate the "fourth disease" of Clement Dukes amongst those diseases which are admitted to the London Fever Hospital.

Reference.—[1]*Lancet* 1910, Oct. 1.

SCABIES. *E. Graham Little, M.D., F.R.C.P.*

Eosinophilia, at one time thought to be diagnostic of certain skin diseases, is, however, so common and widespread that no definite association with special disorders is established. Kolmer,[1] studying eighteen cases of scabies in children, claims to have demonstrated that the disease is accompanied by a mild leucocytosis; and the eosinophiles are increased, relatively and absolutely, in a fairly marked degree, being most numerous during the acme of the eruption, and receding as the disease disappears.

Reference.—[1]*Jour. Cutan. Dis.* 1911, 339.

SCARLET FEVER. *E. W. Goodall, M.D.*

Etiology.—In a paper on diseases of the cow (excluding tuberculosis) affecting the milk, in their relationship to human disease, W. G. Savage[1] makes the following observations in reference to the connection that has been supposed to exist between scarlet fever and a certain disease of the cow: "After critical consideration of the records, I have, personally, come to the conclusion that this—the existence of a constitutional disease, bovine scarlet fever—cannot be accepted as

proved. As an explanation of some of these outbreaks, I would suggest the hypothesis that we are dealing, not with a cow suffering from an infective disease, *bovine scarlet fever*, but with a passively infected cow or cows. The theory which I wish to advance is that when the cow is a source of scarlet fever or other septic disease, it is because it is acting as a carrier of organisms of human origin, often in a purely passive capacity, but sometimes associated with active but local disease caused by the human infecting organism. . . . I regard the bovine udder and teat lesions, so commonly met with, as of purely bovine origin and, as such, harmless to man. Occasionally, either as an invasion superadded upon the original bovine lesions, or as a primary infection of the milk organs, there is a local infection with organisms of human origin. In such cases the conditions present may be decidedly prejudicial to man. In other words, the cow, in this class of infections, is only potentially pathogenic to man when it acts as an active or passive carrier of organisms of human origin."

The question is frequently asked, "How long does a scarlet fever patient remain infectious?" It is not so very long ago that the stereotyped reply was, "As long as he continues to peel." But it is now recognized that desquamation is not to be taken as a sign of infectivity. Most authorities (but not all) believe that infectivity is kept up by a persistent inflammation, however slight, of the nasal passages or fauces, or by some other morbid condition of these regions, such as adenoids or enlarged tonsils. Arnold[2] studied the infectivity of overlooked cases occurring in the City of Manchester during 1907 and the early part of 1908. He defines an overlooked case as being one that "so far as can be ascertained, was not isolated for at least seven days after the onset." Cases discovered early in the illness are usually isolated more or less, so that they afford no evidence as to when their infectivity begins to diminish.

The writer's conclusions are as follows: "To sum up, one may say that scarlatina is a moderately infectious disease for two weeks after the onset, but that a majority of the cases cease to be infectious some time during the second fortnight, so that at the end of the fourth week only a small percentage remain so. Out of this small percentage some, including some mild cases, probably remain infectious for several months, though they are not so recognizable by any known method; it is possible a still smaller number retain the power of infecting for a much longer period, perhaps even so long as a year."

Pathology.—Schultze[3] claims to have isolated a coccus from the secretion of the post-nasal region in cases of scarlet fever, which he believes to be the organism causing the disease. In a preliminary report on the subject he does not, however, give any detailed account of the organism, so that it is impossible to identify it. Until further more exact descriptions are forthcoming, it cannot be said that it has been proved to be the cause of scarlet fever.

Diagnosis.—The difficulties in the way of diagnosis of scarlet fever are attested by the number of papers in which the subject is discussed.

The difficulties are felt mostly in the very mild cases, of which there are so many in these days. If one takes the symptoms of scarlet fever and considers them each separately, there is not one that is really peculiar to the disease; it is not often, therefore, that the diagnosis can be made on one symptom alone, and in such cases help is obtained from some concomitant circumstance outside the case. F. G. Crookshank[4] places considerable importance upon what he believes to be a fairly constant phenomenon, viz., an increase of the pulse-rate out of proportion to the temperature. He also talks of the "characteristic features of scarlatinal desquamation," of which he enumerates four varieties. Of desquamation, J. Fortune[5] writes that "glove peeling is, of course, decisive, and the ringed peeling that occurs about the shoulders and neck is almost equally so." But with all due deference to these authorities, I am of the opinion that they attach too much importance to peeling, unless it is taken into consideration together with other signs. So also as regards the so-called "strawberry" or "raspberry" tongue. An article in a French medical journal[6] draws attention to the fact—which I can confirm from personal experience—that this state of the tongue is by no means confined to scarlet fever. The article quotes G. E. Vladimirov, of Moscow, as stating that it may occur in measles. This is an observation I can also confirm, and I will go so far as to say that a "strawberry" tongue is common in that disease, and far from uncommon in some others.

TREATMENT.—The following statement on the **Eucalyptus Inunction** treatment of scarlet fever, advocated by R. Milne, and before him by Curgenven, is quoted from the Annual Report, 1910, of C. Killick Millard,[7] Medical Officer of Health, Leicester. "The details of the treatment as prescribed by Dr. Milne were faithfully adhered to in every particular, and no change was made until 100 patients had passed under the treatment. The patients thus treated were discharged at the end of three or four weeks. It should be mentioned that the type of the disease at this time was very mild. The conclusions I arrived at were that the period of infectivity was not shortened to anything like the extent claimed by Dr. Milne; indeed, I am not yet satisfied that it has any very appreciable effect in this respect. Nor could I satisfy myself that complications and sequelæ were appreciably diminished, and there was some reason to think that the number of albuminuria cases was increased. This being so, it was decided to modify the treatment by omitting the frequent swabbing of the throat with carbolic oil, which did not seem entirely free from objection, and by reducing the number of inunctions with eucalyptus oil from twice a day for the first ten days to once a day for the first five days. We continued to send patients out early, after three or four weeks, and I may say that the results have been equally satisfactory. Scarlet fever, however, as already stated, after being exceptionally prevalent for several years, is now on the down grade, and simultaneously with the adoption of the new treatment there has been a great reduction in

the prevalence of the disease in the town. I cannot attribute this to the treatment, though it is much more satisfactory that it should be so rather than the reverse."

REFERENCES.—[1]*Proc. Roy. Soc. Med.* iv, No. 5, Epid. Sect. p. 73; [2]*Pub. Health*, 1911, Aug.; [3]*Med. Rec.* 1910, Dec. 10; [4]*Pract.* 1910, Dec.; [5]*Pub. Health*, 1911, Sept.; [6]*Sem. Méd.* 1911, Ap. 26; [7]Quoted in *Pub. Health*, 1911, 445.

SCARS, DEPRESSED. *E. Graham Little, M.D., F.R.C.P.*

The use of **Paraffin** in depressed scars has been rendered more convenient by the newer methods by which cold paraffin is injected under the skin under pressure. Walsh[1] recommends a paraffin with melting-point 105°; this must be sterilized before use, as well as all instruments and the surface of the skin. The needle is introduced about half an inch from the site to be filled up. It should be remembered that the paraffin can be removed only by cutting it out, so that too little rather than too much should be used. Scars left by small-pox, acne, gummata, and the depressions of "wrinkles," if sufficiently disfiguring, may be remedied by this means.

REFERENCE.—[1]*Hosp.* 1911, 338.

SCHISTOSOMIASIS. *Leonard Rogers, M.D., F.R.C.P.*

F. C. Madden[1] writes on the incidence of *bilharziasis* in Egypt, and insists on the serious nature of the problem arising from the fact that a large proportion of the inhabitants are infected. Ten per cent of the admissions to hospital were sufferers from this disease, and at least another thirty per cent are infected in varying degree. Among school-boys about 80 per cent were found by microscopical examinations of the urine, to harbour the parasite, although only 2 per cent showed obvious symptoms beyond slight hæmaturia at times. Post mortems show that 8 per cent of deaths are due to severe bilharzia infection, while incalculable suffering is produced by it. He goes on to describe at length the symptoms occurring in the disease, and concludes that it is high time that an attempt be made to get rid of this plague, although he is at a loss to say how this desirable end is to be obtained.

For the use of **Salvarsan** in bilharziasis, *see page* 53.

O. T. Logan[2] records a case of infection in an American child in China by the *Schistosoma japonicum* producing dysenteric symptoms, the infection having been obtained by wading in a lake.

REFERENCES.—[1]*Brit. Med. Jour.* 1910, ii, 965; [2]*China Med. Jour.* 1911, 104

SCIATICA. *Purves Stewart, M.D., F.R.C.P.*

The name "sciatica" has been somewhat loosely applied to various painful affections in the region of the sciatic nerve. It is important to distinguish between cases of sciatic neuralgia where pain is practically the only symptom, and those of sciatic neuritis in which there are evidences of organic affection of the nerve-trunk in the form of muscular wasting, blunting of sensation, loss of ankle-

TYPES OF SCOLIOSIS RESULTING FROM SCIATICA

Kindly lent by Dr. Plate, Hamburg

Fig. A.—Case of right-sided sciatica, showing tilting of pelvis towards the left side.

Right sciatica. Left sciatica. Left sciatica.

Fig. B.—Three cases of sciatica, showing scoliosis.

Fig. C.—Case of right-sided sciatica, squatting on hips, and then kneeling with hips extended.

Fig. D.—Case of right-sided sciatica, showing forward stoop of trunk and dimpling over gluteus maximus.

jerk, etc. The sciatic neuralgia and neuritis of gouty and rheumatic individuals is familiar, and we need hardly remind the reader of the necessity for excluding in every case extraneous causes, such as sacro-iliac or hip-joint disease, growths or inflammatory masses within the pelvis, disease of the cauda equina, etc. Both in neuralgic and in neuritic sciatica, any movement of the limb whereby the nerve-trunk is made tense, causes acute pain, as in local pressure by sitting on the edge of a hard bench or chair, or from passive stretching of the nerve by full flexion of the hip with the knee extended (Lasègue's sign). One of the "tender points" in sciatica is at the last lumbar spine, especially on lateral pressure from the affected towards the healthy side. An additional physical sign has recently been pointed out by Gara[1] of Pöstyén, who examined for it in 124 cases of sciatica, and found it present in 116. *Gara's sign* is elicited as follows: On palpation of the abdomen with the patient in the recumbent posture, one finger-tip is placed in the middle line, a finger's-breadth below the umbilicus, and another finger-tip is placed two fingers'-breadths external to this, at the same level. Moderate pressure is then made directly backwards, towards the vertebral column, and at once elicits acute pain. It was particularly noted that in no case did the patient previously complain of spontaneous pain in this region. Pressure over the corresponding area on the healthy side produced no pain.

A moderate degree of flexion of the hip occurs in most cases of sciatica, and induces a variety of *scoliosis* of the vertebræ. The mechanism of such scoliosis has recently been carefully discussed by Plate of Hamburg,[2] who emphasizes the role played by the psoas muscle. It will be remembered that the sciatic nerve is the continuation of the main part of the sacral plexus, being derived from the last two lumbar and the first three sacral roots. The nerves forming the lumbar plexus traverse the substance of the psoas muscle, hence if an irritative process spreads upwards to these lumbar roots, the patient involuntarily avoids any tension of the psoas muscle by assuming a defensive posture of slight flexion of the hip-joint on the affected side. The lower limb on the affected side is thus shortened. In order to allow it to rest on the ground in the erect attitude, the limb on the healthy side must be correspondingly shortened. This can be accomplished either by abduction or by adduction of the healthy hip. As a matter of fact, the common posture which is assumed is one of abduction, whereby the pelvis is drooped on the healthy side. When this is done, if we join the anterior superior spines by a line, and draw another line vertically downwards from its mid-point, this line intersects the lower limb of the painful side (*Plate XXXV, Fig. A*). (In a smaller proportion of cases, chiefly in highly muscular individuals, the tilt of the pelvis is reversed, so that the pelvis droops on the painful side.) The tilted pelvis necessarily alters the equilibrium of the trunk, and thus it comes to pass that, in order to compensate, the upper part of the trunk leans towards the side on which the pelvis is higher. There-

fore the common type of scoliosis is one in which the concavity of the trunk is towards the sound side (*Fig. B*). The scoliosis of sciatica disappears when the patient sits down, since the pelvis is then restored to its original horizontal position. This can be well demonstrated by making the patient kneel on the ground. If he then sits back and squats on his heels, the scoliosis disappears, but if he rises on his knees until the hips are again in an extended position, the tilt of the pelvis reappears, and with it the scoliosis (*Fig. C*). But scoliosis is not the only deformity in sciatica. If we look at a patient in profile, we observe that the whole trunk is slightly leaning forwards in order to flex the hip, and with it to relax the psoas muscle. Such forward leaning of the body at the hip-joint throws an extra strain on the extensors of the hip, especially the gluteus maximus, as can readily be felt on palpation or seen by the dimpling of its surface (*Fig. D*).

Plate emphasizes the existence of *tenderness of the psoas muscle* in many cases of sciatica. This can be demonstrated in several ways. Sometimes we can elicit tenderness on direct pressure over the muscle through the abdominal wall, or we may stretch the psoas by one hand pressing on the lesser trochanter, with the other pushed deeply in the space between the vertebral column and the posterior superior iliac spine, or the tenderness may be elicited by attempting to extend the hip-joint with the patient lying flat on his abdomen, this manœuvre producing pain along the course of the psoas. In the prone posture, moreover, the tension of the psoas makes him keep the hip slightly flexed, so that it projects more on the affected side. If we now get the patient to roll round to the supine posture, and ask him to bend up each lower limb against resistance, we find that flexion of the hip is distinctly feebler on the affected side. The foregoing phenomena, according to Plate, point to the presence of myalgia in the psoas muscle. Myalgia, a neuralgia of the sensory nerves of a muscle, is characterized by pain of acute onset and of varying position, being especially severe when the affected muscle is actively contracted or passively stretched. The loss of function of a myalgic muscle is only an apparent one. The patient involuntarily avoids movement of the muscle, whether by stretching or by strong shortening, and therefore keeps it fixed and slightly contracted. The psoas is innervated by branches of the lumbar plexus, and Plate contends that in sciatic neuritis it is not uncommon for the inflammatory process to extend up to the lumbar plexus which lies within the substance of the psoas. In every case of sciatic neuritis, therefore, we should search for evidence of myalgia in the psoas, and if such be present, it must be treated. For the myalgia Plate recommends **Hot Applications, Massage,** and **Counter-irritation** over the site of pain. He specially commends **Hot Sand-baths,** followed by baths of **Hot Water,** during which the sciatic region is massaged, and passive movements of the affected limb are carried out by a skilled attendant. Strong counter-irritation over the lumbar vertebræ and along the course of the sciatic trunk is also employed. In some cases he claims to have obtained good results

from the injection of 15 c.c. of a solution containing **Eucaine** and **Alypin,** the needle being plunged deeply into the muscle from the outer side, entering immediately in front of the transverse processes of the vertebræ.

In the *Medical Annual* of 1910 (page 545) I discussed the technique of Lange's treatment of sciatica by means of massive **Injections of Normal Saline Solution,** 80 to 100 c.c. being injected at one time into the region of the nerve-trunk, with or without the addition of 0·1 per cent of **Eucaine** β. Further experience of this method has confirmed previous opinions as to its value. I have employed it successfully in a number of unpublished cases, and Hay[3] has recorded twelve cases with eight cures, although in his series the quantities of saline solution injected were comparatively small (10 c.c.), and repeated several times at intervals of three days or longer.

REFERENCES.—[1]*Deut. med. Woch.* 1911, Apr. 20; [2]*Ibid.* 1911, Jan. 19; [3]*Glas. Med. Jour.* 1911, 256.

SCLERODERMA.

(*Vol.* 1911, *p.* 572)—It is suggested that the oral administration of **Thyroid Extract** may prove beneficial.

SCORPION BITE. *Leonard Rogers, M.D., F.R.C.P.*

George Thin[1] records two cases of gangrene following scorpion bite in Egypt in neglected cases among natives, in one of which the trouble was caused by a tight ligature. Severe collapse may result from scorpion stings, but death is rare except in a young child.

REFERENCE.—[1]*Brit. Med. Jour.* 1910, Oct. 29.

SCROFULODERMIA.

(*Vol.* 1910, *p.* 550)—This is one of the many cutaneous lesions amenable to treatment by application of **CO_2 Snow.**

SCURVY.

Gums rapidly healed by **Salvarsan** treatment (*page* 55).

SEA-SICKNESS. *Purves Stewart, M.D., F.R.C.P.*

Amongst the minor ailments to which travelling mankind is exposed, perhaps none produces greater misery, for the time, than sea-sickness. In the *Medical Annual* we have from time to time mentioned remedies which have been found useful in the complaint. This year Welsh[1] has emphasized the value of **Chloretone.** He recommends 10 gr. in capsule, followed by 5 gr. three times a day for two or three successive days. His own experience during a voyage from Australia was that, having been previously a victim of sea-sickness, he practically abolished the symptoms, and even during the roughest weather an occasional 5-gr. dose was sufficient to cut short any incipient nausea. He records a remarkable case in a young Cingalese student who had never been to sea before. As soon as the ship reached open water, he became acutely sea-sick, with constant vomiting. This lasted three days before Welsh was asked to see

him. Chloretone 10 gr. was given in powder and washed down by a little water. The patient had previously vomited fourteen times that morning. Immediately after the first dose the vomiting ceased. Later in the day he took his meals with the other passengers, and completed the remainder of the voyage without further sickness, taking an occasional 5-gr. capsule.

Even more dramatic are the results claimed by Kendall[2] for **Validol,** which is a 10 per cent mixture of menthol with valerianic acid. Here again, Kendall himself had been a constant victim of sea-sickness. During several voyages to and from Australia he has employed this remedy in a number of cases, and proclaims himself and his fellow-travellers who had taken it, to be now perfect sailors. He advises patients to begin taking the remedy two or three hours before sailing, and to continue its use every hour until all sensation of nausea is abolished. The first dose is 30 drops taken on a lump of sugar, followed by 25 drops for the second dose, and 15 drops for the third. He states that he has never required to give more than three or four doses. This remedy is simple in its application, agreeable to the taste, and harmless in its action.

References.—[1]*Lancet*, 1911, June 24; [2]*Med. Press*, 1911, June 14.

SEBORRHŒA CAPITIS; PITYRIASIS.

E. Graham Little, M.D., F.R.C.P

Agnes Savill[1] claims an excellent result in one case of true oily seborrhœa capitis with injections of a **Vaccine** prepared from a culture of the *Microbacillus seborrheæ* of Sabouraud; the doses being from 100 to 300 millions at intervals of about ten days, four injections in all being given. The diagnosis had been confirmed by finding micro-bacilli of Sabouraud in great quantities in the scalp. In another similar case the injections improved but did not cure the condition.

White,[2] using a classification and nomenclature somewhat difficult to follow, analyses 679 cases of "*loss of hair*" thus:—

	Cases.	Male.	Female.
"Alopecia simplex" ..	.. 115	.. 37	.. 78
"Alopecia furfuracea" ..	.. 443	.. 206	.. 237
"Alopecia areata" ..	.. 86	.. 46	.. 40
Alopecia from ringworm ..	.. 16	.. 9	.. 7
Alopecia from *x*-rays ..	.. 2	.. 1	.. 1

Alopecia simplex is defined as simple loss of hair without other objective symptoms—a definition which it would seem should include alopecia areata.

Alopecia furfuracea, which would include pityriasis and seborrhœa capitis, using the nomenclature popularized by Sabouraud, accounts for the large majority of cases; and White claims to have found the following four ointments most useful in this condition:—

℞ Acid. Salicyl. Sulph. Præcip. āā ʒss } Petrolati ʒj

Ointment. Apply at night. Shampoo with a simple soap the following day.

R	Pilocarpin Nitrat.	gr. j	Tr. Canthar.	
	Quinin Sulph.	gr. x	Tr. Capsic.	āā ℥iij
			Alcohol 70 per cent	ad fl. ℥viij

Wash for scalp. Apply in the morning.

R	Acid. Tannic	gr. xxxv	Ol. Ricini	♏xv
	Chloral. Hydr.	gr. xxvij	Alcohol 70 per cent	fl. ℥vj
	Acid. Tartar.	gr. xxx		

Wash for scalp. Apply in the morning.

R	Hydrarg. Chlor. Corros.	gr. iv	Ol. Ricini	℥j-iij
	Euresol	℥ij	Alcohol 70 per cent	ad ℥viij
	Sp. Formicarum	℥j		

Wash for scalp (poison). Apply two teaspoonfuls in the morning.

The last of these four he holds easily first for successful results.

References.—[1]*Pract.* 1911, i, 392 ; [2]*Jour. Amer. Med. Assoc.*, 1910, ii, 1074.

SEMEN, IDENTIFICATION OF. *O. C. Gruner, M.D.*

Barberio[1] claims that his reaction is specific for human semen. It consists in the production of crystals by picric acid. One to two c.c. of semen (if necessary, mixed with water and filtrated) are treated with an equal volume of saturated aqueous picric acid, and the abundance of yellow precipitate that forms is dissolved again on boiling. The mixture is filtered while hot, and on cooling the specific crystals are observed with a microscope. It is feasible to perform the reaction entirely upon a microscopic slide, observing the preparation at a 150 magnification. The crystals are octohedral, and are like calcium oxalate, except for being very strongly doubly refracting. They are readily soluble in a 10 per cent solution of iodine, a drop being run in under the cover-glass. This last property is not specific for sperma crystals, but the only substance which simulates them is potassium picrate; this, however, is not soluble in a dilute hydrochloric acid, whereas the specific crystals are. The author claims that the reaction is far more useful than that of Florence, because it will come out positive after a long preservation of the material (even after several years) to be tested. The Florence reaction, on the other hand, fails after fourteen days as a rule. Some authors claim that the reaction is also occasionally given by animal semen, but the author is positive that this observation is erroneous.

Reference.—[1]*Deut. Med. Woch.* 1911, 214.

SEXUAL NEURASTHENIA.

Anaphrodisiac action of **Adalin** (*page* 3).

SINUSES. *Priestley Leech, M.D., F.R.C.S.*

Maynard[1] speaks well of the use of **Beck's Bismuth Paste** in the treatment of sinuses. The causes of failure may be the presence of foreign bodies, faulty technique, faulty bismuth subnitrate. The method is contraindicated in acute conditions, in biliary and pancreatic fistulæ, and in sinuses connected with the cranial cavity. It is now

being used in nasal and aural suppurations, and Maynard is trying it in lacrymal fistulæ. Bismuth poisoning may occur if the cavity is a large one. If such symptoms arise, the paste must be removed by washing it out with warm sterile oil. If the oil is left in for 24 hours the paste becomes an emulsion which can be sucked out with a syringe. Scraping it out is risky, as it may open fresh channels for absorption.

REFERENCE.—[1]*Ind. Med. Jour.* 1911, Ap.

SKIN DISEASES, GENERAL THERAPEUTICS.

E. Graham Little, M.D., F.R.C.P.

Carbon Dioxide Snow and Liquid Air. — Captain Matthews[1] has employed carbon-dioxide freezing with success in India, and notes that relatively longer exposures are required in hot than in cold weather. Frescolm[2] recommends its use in *nævi, warts, moles, lupus erythematosus,* and *cutaneous epithelioma* other than rodent ulcer ; for the latter condition he finds it inefficient. [A conclusion with which my experience does not incline me to agree.—E. G. L.]

Beebe[3] regards liquid air as preferable to carbon dioxide, on the ground that the application is less painful, and fewer treatments are required. The average time of application was twenty seconds, repeated when necessary after a fortnight's interval, and success was obtained with *nævi, moles, warts, pigmentations, xanthoma, epithelioma,* and *lupus erythematosus.*

Bunch[4] discusses the treatment of *nævi* by freezing, and prefers carbonic dioxide snow for small lesions, liquid air for large " port-wine " areas ; for the latter, exposures of five to seven seconds suffice ; the liquid air is applied with a swab of cotton-wool on a stick. Allworthy[5] has a pertinent note emphasizing the necessity of inverting the carbon dioxide cylinder when collecting the snow.

Patterson,[6] on theoretical rather than practical grounds, sounds a warning on the possibilities of producing epithelioma by applications of carbon-dioxide freezing. Ochs[7] reports three cases of neuralgia after carbon-dioxide freezing. Hall-Edwards[8] suggests some useful apparatus for the collection and moulding of the snow, supplied by Philip Harris & Co., Birmingham.

Passive Hyperæmia.—Sibley[9] has applied Bier's hyperæmic methods in the treatment of several diseases of the skin, and has found advantage from their use. Suction-cups are the most convenient method of inducing local hyperæmia over small areas. For conditions which call for considerable degrees of hyperæmia, e.g., *acne, alopecia, psoriasis, scars,* repeated applications of the cup for five minutes at a time, with three-minute intervals, this treatment to be applied for an hour daily, are advised. For *chronic ulcers, sycosis, impetigo,* one application of five minutes daily may suffice ; for *lupus vulgaris* one-minute treatments daily will usually be enough. The cups should be sterilized before use.

Thorium Paste.—Bulkley[10] reports a series of cases which were treated in his clinic by a paste, the exact composition of which is not

explained, but which contained thorium, protoxide of lead, sulphate of lead, sulphuric and hydrochloric acids. This formed a semi-fluid, which was painted on the diseased surface with a camel-hair brush ; an adhesive pellicle was left in situ and remained adherent for a week or ten days. The active ingredient was no doubt thorium, and the effect obtained varied with the percentage of thorium employed ; the paste may be diluted with water, or with ointment-bases ; experience with it appeared to show a remarkable effect in stimulating the growth of granulation-tissue. Excellent results were obtained in *epithelioma*, *lupus vulgaris*, *lupus erythematosus*, and *nævus vascularis*.

Vaccines.—In an interesting discussion at the American Dermatological Association,[11] Engman, Gilchrist, Towle, Linginfelter, and others took part. The most satisfying results were found in *boils*, *carbuncles*, *eczematoid suppurative conditions*, *sycosis*, *pustular folliculitis*, *acne varioliformis*, and *acne vulgaris*. Engman uses the *acne* bacillus emulsions without staphylococcus in the latter disease ; Gilchrist prefers the combination of acne vaccine with staphylococcus where there is pustulation. Engman prefers small doses of 3 million rising to 7 million given at frequent intervals, and he has evolved a technique which he has found satisfactory : beginning with a 3-million injection, on the third day after, the comedones and superficial pus collections are expressed, and local hyperæmia is employed ; 3 to 5 million are given again on the fifth or seventh day, and repeated at these intervals. Gilchrist uses a commencing dose of 5 million, to be raised to 30 million in weekly injections, and has had many " cures " with seven to ten injections.

With *staphylococcus infection*, Engman also uses smaller and less frequent doses than Gilchrist ; the former prefers initial doses of 50 to 100 million, repeated about every six days. Gilchrist begins with 300 million, and repeats this three times a week. Both authors regard the *Staphylococcus albus* vaccine as equally effective against infection of *Staphylococcus aureus*. Gilchrist used *Staphylococcus albus* vaccine empirically in a number of diseases not known to be of microbic origin, e.g., erythema multiforme, and found surprisingly successful results, which he explains on the hypothesis that these diseases are due to toxins of staphylococcus origin, the seat of invasion being the intestines. *Rosacea* was very favourably affected by staphylococcic vaccines, and so was *urticaria*. *" Seborrhœic " eczema* improved uniformly with *Staphylococcus albus*. *Psoriasis*, *parapsoriasis*, *lichen planus*, and *lupus erythematosus* gave entirely negative results.

King-Smith[12] has found the happiest results with *erysipelas*. Stock vaccines were used, injections of 250 million streptococci being made and repeated on the next day—the severer the case, the smaller the dose. The site of inoculation should be remote from the disease. Excellent results were obtained with staphylococcic albus injections in *scaly eczema* without suppuration. With sycosis and furunculosis the mixed staphylococcus vaccine was used, in doses of 125 million repeated twice weekly, and eight or nine injections being given. In *acne* the

results were disappointing with the acne vaccine, but brilliant with the suppurating cases, in which staphylococcus was added. Acne vaccine was used in small doses—5 million at a time, repeated twice a week.

References.—[1]*Ind. Med. Gaz.* 1911, Apr.; [2]*N.Y. Med. Jour.* 1911, Apr. 29; [3]*Bost. Med. and Surg. Jour.* 1911, Mar. 16; [4]*Pract.* 1910, ii, 583; *Brit. Med. Jour.* 1911, Feb. 4; [5]*Ibid.* 1910, Nov. 19; [6]*N. of Engl. Clin. Jour.* 1911, 51; [7]*Med. Rec.* 1910, Sept. 17; [8]*Lancet*, 1911, ii, 87; [9]*Arch. Röntgen Ray*, 1911, 422; [10]*Med. Rec.* 1911, Apr. 22; [11]*Jour. Cutan. Dis.* 1910, 553 *et seq.*; [12]*Ibid.* 1911, 432.

SKIN, MALIGNANT GROWTHS OF. *E. Graham Little, M.D., F.R.C.P.*

Loeb[1] analyzes the factors producing malignancy in epithelium as internal and external, and remarks that there is much to be learned about the former. He discounts the embryonic theory of Cohnheim; that associated with Ribbert, which regards the cancer cell as an ordinary regenerative cell separated by inflammatory tissue from its kindred epithelial cells; and the theory that micro-organisms are concerned in its production. Age acts probably as affording a merely more prolonged exposure of the epithelium to irritants, such as light, heat, and chemical substances which are potent causes of malignant change.

Mallory[2] takes up the consideration of the *non-epithelial tumours* showing malignancy. Classification of these should rest on the character of the type-cell of which they are composed, irrespective of the rate of growth. Thus all tumours derived from the fibroblast—the connective-tissue cell—are grouped together; the slowly-growing ones are fibromata; the rapidly-growing ones fibro-sarcomata. Similarly, the muscle cell, fat cell, neuroglia cell, pigment cell, are well characterized cells giving rise to characteristic tumours. Endothelial cells are much less definitely differentiated; the endothelium lining blood- and lymph-vessels is probably identical. Tumours derived from these cells are endotheliomata. Many pathologists use this term only for rapidly-growing tumours of endothelial cells, the slowly-growing tumours being called angiomata; the latter should be called "hæmangio-endotheliomata," and are of two types—capillary and cavernous.

Fordyce[3] argues that the multiple etiology of cutaneous malignant growths makes a parasitic causation improbable, and especially the fact that epitheliomata so frequently develop in response to exposure to radiant energy—heat, light, and *x*-rays. The tendency for cancer to appear on scar tissue and sites of the so-called precancerous conditions—lupus vulgaris, syphilis, etc.—would go to show that we are dealing with misplaced cells in some cases, and in others with degenerative processes which lead to the abolition of the functional activity of the cells, which is followed as a consequence by vegetative activity.

Epitheliomata on the Upper Lip.—The occurrence of the disease in this position in negroes seems extremely rare, no record of it existing in the Surgeon-General's library. Kerr and Hazin[4] report such a case

PLATE XXXVI.

SARCOMA CUTIS

(Graham Little)

in a healthy pure negro, a non-smoker and non-drinker, free from venereal disease. Epithelioma, whether of skin or mucous membranes, would appear to be very rare in the negro race, even in localities where cancer among whites is common.

Skin Cancer in Tar-workers.—This is of the same type as the so-called "chimney-sweep's cancer." In a factory of workmen engaged in smearing tar on paper at a high temperature, Schamberg[5] found five cases with more or less advanced epitheliomatous changes supervening on the follicular keratosis due to long contact with tar. Multiple tumours developed on the arms and hands in all five cases. The change seems most prone to occur in the fourth decade. Workers in paraffin are also much exposed to this accident, the scrotum being, as in chimney-sweeps, a favourite site. Coal tar appears to owe its irritant properties chiefly to the "heavy oil," one of the resultant products, consisting largely of naphthalene. There is a similar irritant substance in tobacco, a fact which brings "smoker's cancer" into line with these cases; the chewing of tobacco would bring this irritating effect into play, and the habit has been noted in many cases of smoker's cancer.

A detailed list of reported cases of "chimney-sweep's cancer" is given. Schamberg has been able to collect only twenty-six since its first description by Pott in 1775.

Dubreuilh[6] reports a remarkable series of five cases of *sarcomatosis of the skin* in young children, and analyzes the literature; some twenty cases in all are recorded. The disease is more often congenital, but it may develop soon after birth, or after a considerable interval—five or six years. The tumours may be unique or multiple, and are usually of the embryonic round-cell type. The picture (*Plate XXXVI*) was drawn from a case of my own, a man aged twenty-five, who died within three months of the first appearance of the tumours. He had been under treatment by arsenic in large doses, and under this regimen the tumours had disappeared to a great extent. A similar disappearance under arsenic is quoted by Dubreuilh. Probably treatment by *x*-rays affords the best hope of relief; when this is not practicable, as in the diffuse form of eruption, arsenic should be given in doses up to toleration point.

Sherwell[7] is enthusiastic in recommendation of **Curetting** malignant growths—carcinoma, epithelioma, or sarcoma. Fenestrated curettes of varying size are used; the patient is anæsthetized and the morbid tissue completely scraped away; bleeding is stopped by adrenalin and cocaine compresses, or preferably by a touch with Paquelin's cautery. After thorough local anæsthesia is obtained, the wound is washed with **Acid Nitrate of Mercury** 60 per cent, which is allowed to act for five to twenty minutes, when it is to be neutralized with **Sodium Bicarbonate** dusted over the part, which must be kept dry. Pusey[8] also recommends the use of curetting and caustics, but places these means second to treatment by *x*-rays, which he prefers to radium. In positions such as the genitals and the lower lip, the necessity for

removing glands makes the radical surgical removal of the disease preferable to local destruction. He condemns the use of freezing by carbon dioxide or liquid air except in very superficial rodent ulcers.

Graham Little[9] on the other hand, found **Carbon Dioxide** freezing a very satisfactory method, as well as **Zinc Ionization** in a series of cases of *rodent ulcer* not always superficial. Walker[10] also was very satisfied with carbon dioxide freezing in the treatment of cases of lupus carcinoma. This writer also recommends curetting, followed by caustics, of which **Arsenious and Chromic Acids** are the best.

References.—[1]*Jour. Amer. Med. Assoc.* 1910, ii, 1607; [2]*Ibid.* 1621; [3]*Ibid.* 1624; [4]*Jour. Cutan. Dis.* 1911, 321; [5]*Ibid.* 1910, 642; [6]*Ann. de Derm.* 1911, 340; [7]*Jour. Cutan. Dis.* 1910, 487; [8]*Jour. Amer. Med. Assoc.* 1910, ii, 1610; [9]*Brit. Med. Jour.* 1911, ii, 14; [10]*Edin. Med. Jour.* 1911, i, 301.

SMALL-POX. *E. W. Goodall, M.D.*

In a practical paper on the *examination of cases suspected to be small-pox*, A. F. Cameron discusses in detail the diagnosis of such cases. The paper is divided into two main portions: (I) *Subjective Conditions*, and (II) *Objective Conditions.*

(I) Subjective Conditions.

Under this heading is discussed the importance to be attached to the statements made by the patient, and to the history of an exposure to the specific infection. It is pointed out that at the present day small-pox "finds the great majority of its victims among the most ignorant of the population. These people resent compulsory examination" and the irksomeness of hospital isolation and discipline. Hence statements made by the patient and his friends are seldom to be relied upon, and are often wilfully misleading. Occasionally the initial illness is so slight that a patient of this class will have paid no attention to it, and therefore can give no satisfactory account of it. The initial symptoms are often those common to many acute febrile diseases, and even pain in the back is not always present. "In a feverish attack with sudden onset, the presence of severe pain in the back does not necessarily point to small-pox, nor is the absence of this local pain inconsistent with the onset of small-pox of the most virulent type." In illustration of this statement the author describes cases of virulent small-pox, with pain in the belly but not in the back; of pneumonia, and chicken-pox, each with severe lumbar pain.

If a person who is seized with the symptoms of an acute febrile disease has been exposed to the infection of small-pox for ten days or a fortnight previously, there would naturally be a strong suspicion of small-pox. But if he is removed to a small-pox hospital, it is a wise precaution to vaccinate him before his admission.

(II) Objective Conditions.

General Aspect.—On this the author writes as follows: "The small-pox patient whose invasion period has been severe, and whose pain has abated with the beginning of the eruption, gives one the impression that he has passed through an exhausting struggle. His face and his attitude express weariness and apathy. His voice is apt to be low-toned and monotonous. His mental processes are slow, and control over his movements is often defective. For example, his reply to a question may be appreciably delayed, the question may have to be repeated, and his movements are often retarded, tremulous and jerky. In the presence of such conditions he may assert that he feels much better since the pain has abated. But he will stagger if he tries to walk, and is likely to fall if not supported. It is not suggested that these symptoms are peculiar to small-pox; but they are frequently present in severe cases of this disease, and they have their value as indicators. From their association with the stage of the primary fever towards its end, they are at their highest value when, after a day or two of a severe 'influenzal' illness, their presence is accompanied by an eruption of 'spots,' however discrete the eruption may be."

Temperature—"In cases which have been under observation during two or three days of a feverish illness, a fall in temperature, associated with the appearance of 'spots' on the skin, however few and widely scattered the lesions may be, is an indication of the highest importance."

The Buccal Mucous Membrane.—The soft palate is the part most frequently the seat of the eruption, but the whole of the mucous membrane of the mouth, including that of the tongue, may be involved. As the pocks undergo vesiculation more rapidly on a mucous surface than they do on the skin, the presence of vesicles may be recognized in the mouth at a date when the lesions on the skin are still in a somewhat indefinite stage. On a mucous membrane the vesicles quickly rupture, and the resulting lesions are shallow, so that a good light is necessary in order to see them. Vesicles occur on the buccal mucous membrane in chicken-pox as well as in small-pox; but as a rule they are neither so frequently met with nor so numerous in the former as in the latter disease.

Signs of Previous Vaccination.—A patient may be successfully vaccinated at the time of infection with small-pox or during the period of incubation, and he may still develop small-pox, as both this disease and vaccinia may run their course together; so that the presence of very recent lesions of vaccinia in a person who is also the subject of a suspicious eruption, if the vaccination has been performed upon the appearance of this eruption, is no help in the diagnosis. On the other hand, a successful vaccination performed after the appearance of the suspicious eruption, negatives the diagnosis of small-pox. But an unsuccessful vaccination goes for nothing. In the case of a patient

with symptoms suggestive of the commencement of an attack of small-pox, the presence of old vaccination scars is of no assistance whatever in diagnosis.

The Cutaneous Signs of Small-pox.—The author points out that small-pox is capable of producing three distinct types of eruption: (1) Erythema; (2) Purpura; and (3) Vesicles (the pocks). The first two forms are often met with before the pocks proper to the disease make their appearance.

1. Erythema.—"The position which this occupies as a differential test for small-pox may, perhaps, be most easily indicated if the following features are taken to represent the type: it has no definite unit, but consists of patches which are irregular in contour and vary much in size; it is hapazard in distribution; it is not a raised rash; it does not affect the face. This negative method of setting out the characters of the rash may serve to indicate that in a considerable proportion of its examples the erythema is in itself of little assistance in diagnosis, but acquires importance only from being associated with a purpuric or vesicular eruption, present at the time of examination or superimposed on the erythema during a short period of observation."

There are *exceptional varieties* of the initial erythema:

i. Those in which the rash, by assuming more positive features, becomes in itself an indicator of considerable value. (*a*) One feature, which is, however, rare, is a tendency to symmetry in distribution, especially on the extremities and about the extensor surfaces of the large joints, along the inner margin of the feet, or along the radial side of the forearm. The patches of erythema are very brilliant, almost vermilion in colour. There may at the same time be similar patches, but not symmetrically disposed, on the trunk. Such patches may have on one side a very abrupt margin. (*b*) In the most severe form of toxic small-pox the initial erythema may take the form of a continuous sheet of erythema, and in this variety the face is usually affected. The colour is very brilliant. It is not at all punctate. At its first appearance it is not unlike the blush produced on the hands and arms when they are plunged into hot water.

ii. In this group are cases in which the erythema resembles that of some other disease; hence there may be considerable difficulty in diagnosis. Scarlet fever and measles are the diseases which are most likely to be thought of, instead of small-pox. Only a most careful study of the character and distribution of the rash, and a thorough search for any other evidence, will save a mistake at times; especially should the presence of papules be sought for.

2. Purpura—This may be present in one of several varieties. There is the staining left by a fading erythema. There are the small, bright red petechiæ, which are especially to be found about the flexures of joints. Again, there is the readiness to bruise; and lastly, there are large purple subcutaneous hæmorrhages. Now all these varieties of hæmorrhage are to be found in all the acute specific febrile diseases, as well

as in other conditions ; but they are more frequent in small-pox than in any of these diseases. In the London epidemic of 1901 it was found that out of 1,232 consecutive cases of small-pox, in 271 there were purpuric cutaneous lesions at some time during the attack, that is in 22 per cent.

The petechial lesions of small-pox are usually very densely set, and are prone to extend for some distance beyond the limits of the flexures of the joints. On the value of purpura in the diagnosis of small-pox, Cameron writes as follows : " Given an onset of a febrile disorder pointing to an acute infection and associated with purpura, small-pox should occupy the first position as a possible cause, and one may go further and say that the probability of small-pox increases according to the severity of the purpuric lesions as regards both their number and type. Assuming this position, it seems hardly necessary to separate the so-called petechial initial or prodromal rash from the other more severe purpuric lesions of the disease, or still further to accentuate the difficulties of the diagnosis by describing a so-called hæmorrhagic variety of small-pox as if it were classed by itself. One can hardly avoid forming the opinion that some at least of the missed cases of small-pox, and most certainly those rare and virulent examples (by *virulent* meaning of high infective power as well as deadly to the individual), which have the purpuric sign as their outstanding feature, would not escape if these facts were fully recognized. Several missed cases belonging to this type, which have been labelled ' blood-poisoning,' came under notice during the epidemic of 1901–2. Each of them acted as a centre from which the infection spread, and from one of them more than twenty patients contracted the disease by direct contact."

[I am not disposed to agree entirely with the author's opinion as here stated. I do not think he sufficiently emphasizes the importance in diagnosis of the limitation in distribution or the remarkable density of the initial erythematous or petechial eruption in those cases, not a few in number, in which the abdomino-crural region is so especially affected. There is doubtless in the minds of many who have had no first-hand experience of small-pox some confusion as regards the hæmorrhagic form. It does not appear to be sufficiently understood that a patient may have small-pox of the hæmorrhagic variety and die, before the characteristic eruption of papules makes its appearance. In my experience, cases of hæmorrhagic small-pox seen at any early stage get mistaken for purpura hæmorrhagica or for typhus fever. There should be no difficulty in respect of the latter disease ; but with certain cases of purpura of the fulminating variety, and more especially in those in which a fatal termination may ensue within two or three days, the diagnosis will often be extremely difficult. In such instances most minute enquiry should be made as to the possibility of previous contact with a small-pox case.

Another point in the diagnosis of the initial erythematous rashes of small-pox is that they are very seldom seen in children under ten

years of age, at any rate in this country. This is mentioned by most writers on the subject.—E. W. G.].

3. The Vesicle or Pock.—In a population which is to a certain extent protected by infant vaccination, there will be in an epidemic of small-pox a considerable number of cases in which, after a smart initial illness, a scanty papular eruption appears. As at the same time the patient loses all his other symptoms, he is prone to pay little attention to the appearance of a few pimples, as he regards them, and to consider himself to be convalescent if not quite well, and so to resume his ordinary duties. A third to a half of all cases are of this description, so that in a very considerable number of cases the diagnosis has to be made on the character of the eruption. The eruption must be considered in respect of (i) The individual lesions, the separate pocks, that is; and (ii) The pocks taken collectively, and especially as regards their distribution.

(i) *Features of the Lesion or Unit.*—Each individual pock goes through two processes, that of *progression* from the macule, through the papule to the vesicle, and that of *retrogression* from the vesicle, through the pustule to the separation of the crust. The process is an inflammatory one, and its peculiar features are its deep-seated origin, its intense and localized character, and the acuteness of its course.

The stage of progression. The macular stage is transient and not often observed. When the papule appears it does not involve the whole of the macular area. Pain is frequently associated with this stage of the lesion, and is of considerable importance in diagnosis. The patient usually describes it as being a pricking sensation, and it is brought out by pressure. It is most marked where the epidermis is thick, and by this feature lesions which are barely visible may be detected on the palms and soles. To the touch, the papule presents a "slight elevation with gradual slope and a considerable area." As the vesicles increase in size they become most prominent where the skin is of finer texture. "Under the lens the erythematous area in which the lesion is situated may be seen to resolve itself into three zones. The margin of the tiny lesion is marked by a narrow ring of a tint distinctly paler than the area within it, or the much more extensive and irregular area outside it which forms the areola. As the central area increases in diameter it loses its colour, and at last, when the vesicle is quite apparent to the eye, the anæmic marginal ring becomes merged in the translucent pellicle of the lesion." Where the skin is thin the vesicle stands out well, and can be grasped between the finger and thumb; but where the skin is thick, the vesicles cannot be grasped. At this stage, also, the vesicle is very painful when it is squeezed or pressed very firmly. On the palms and soles the lesion appears now as a small, dark, almost black area. Wherever situated, the lesion has "a sensation of unyielding solidity."

The stage of retrogression. The contents of the vesicle become at first opalescent, and later yellow from pus, and there is swelling with induration of the surrounding skin, so that the lesion is less

definitely localized. The sensation of unyielding solidity now disappears ; the lesion becomes superficial and can be readily ruptured. Then a yellow or dark brown crust forms. On the palms and soles, where the epidermis is thick, the pustule often does not rupture. Part of its contents is absorbed, and the remainder, with the thick follicle, constitutes the deep-seated crust or " seed."

There are several conditions which, by interference with the development of the lesion of small-pox, may alter its characteristics so as to confuse diagnosis. The lesions (*a*) *May be accidentally injured*, perhaps by the patient himself ; or (*b*) *May be altered by some degree of protection* against the disease possessed by the patient. In this case the severity of the rash is diminished by decrease in the number of pocks and in the amount of local changes. The latter factor is the most important from the point of view of diagnosis. The period of development of the pock is much shortened, and the vesicle or pustule is small and ill-formed. But on the palms and soles the lesion is much less modified than it is in other places. The author states that observation for a short period will show in many puzzling cases that the lesion does go rapidly through definite stages, and that this will distinguish the eruption of small-pox from rashes due to such causes as mosquito bites, severe acne, a pustular syphilide, impetigo, and certain drug rashes. (*c*) *Lowering of the general physical condition* of the patient, for example, by old age or previous ill-health, will alter the character of the eruption. In fact, from the point of view of diagnosis this is the most important condition. The lesion develops badly ; the eruptive period is prolonged ; the vesicle is of irregular outline, flat and flaccid, not very prominent, and rather like the lesions of severe chicken-pox.

(ii) *The Collective Features of the Lesions.*—Their tendency is to group themselves on some skin areas rather than others. The eruption of small-pox has a predilection for those parts of the skin which are subject to irritation, using this word in its widest sense. Usually it means exposure to air and the friction of clothing. Exceptionally it may mean the irritation set up by other agents, such as a mustard plaster, or recent vaccination lesions. Because of exposure to air, the face and hands bear the brunt of the eruption. On the other hand, the flexures of joints, being protected from the friction of the clothes, are usually the least affected. *Severe eruptions.* Small-pox with a confluent or severe discrete eruption is not often mistaken for any other disease. But other diseases, especially chicken-pox and syphilides, get mistaken for small-pox. The error is to be avoided by carefully studying the distribution, for though the face may be markedly involved in these diseases, the trunk is evenly invaded (in small-pox the back shows more pocks than the front), and the proximal parts of the limbs more than the distal, the reverse being the case in small-pox. *Mild discrete eruptions.* As a rule the law of the distribution of the small-pox eruption applies to cases in which the eruption is more or less scanty. " The only reason for considering

mild discrete eruptions under a separate heading is that in a minority of small-pox cases of this type the complementary factor of freedom from irritation, or protection against irritation, acquires considerable importance in its effect on the distribution." If a person has been living his ordinary life just before he is seized with small-pox, the distribution of the pocks will follow the law. But if from some cause or other he has been living under conditions which have protected him from the cutaneous irritation to which he is usually subject, the distribution may be very considerably modified. This is especially to be noticed in chronic invalids. "It is a frequent feature of the rash of the old and infirm, and in these cases it may be sufficiently powerful to mark the typical gross inequalities in the density of the lesions. A very scanty eruption is the rule in cases of this type. But the face very rarely escapes, although the hands and feet are occasionally free from eruption."

According to the author, it is probable that the causes governing the distribution of the pocks influence the *site of their first appearance*. The rash almost invariably comes out first on the face and hands. "But definite local irritation may be sufficient to interfere with this usual sequence. For example, a washerwoman admitted as a contact developed a rash which had its densest setting on the arms and hands, it was on these parts that the first lesions were seen." A very important fact in the diagnosis of small-pox is that the pocks appear on the extremities—and especially on the hands and feet—very soon after the beginning of the eruption on the face.

As the eruption continues to advance through its various stages, it will be noticed that the stage which the pocks have reached will be according to priority of appearance. But in distinct and modified cases, just in fact those in which diagnosis is difficult, this distinction is lost, because the pocks go through the different stages quickly.

TREATMENT.—The use of **Salvarsan** is advised on *page* 56.

REFERENCE.—[1]*Brit. Med. Jour.* 1911, i, 741.

SNAKE VENOMS. *Leonard Rogers, M.D., F.R.C.P.*

Prentiss Willson[1] records two cases of bites from copperhead snakes, and analyses 97 cases of such bites, which form 17 per cent of all snake-poisoning cases in the United States. The death-rate was only 5 per cent, partly due to secondary septic infection of the wounds. On account of this low mortality he thinks drastic treatment is often unnecessary. Ligatures should be applied between the wound and the heart, sufficiently tightly to impede without stopping the circulation, so as to make the absorption of venom more slow, but no interference with the wound is needed except to apply **Antiseptic Dressings,** unless the patient is a young child, in which case **Incision,** with the application of **Permanganate Crystals,** is indicated under antiseptic precautions. **Adrenalin** is useful to counteract the low blood-pressure.

REFERENCE.—[1]*Jour. Amer. Med. Assoc.* 1910, 770.

SPERMATIC CORD, SEPTIC PHLEBITIS OF.

Leonard Rogers, M.D., L.R.C.P.

R. Bird[1] records, from Calcutta, seven cases of this rare condition, similar to those previously described by Castellani under the name of funiculitis. It is distinguished by its sudden invasion, the rapid development of septicæmia, and its fatal termination if not promptly and effectively treated by removal of the testicle with the spermatic cord right up to the brim of the pelvis. The disease is accompanied by marked fever and prostration, and the tissues after removal show very numerous streptococci, which were also obtained from the blood in one fatal case, with very intense inflammatory changes.

REFERENCE.—[1]*Ind. Med. Gaz.* 1910, 414.

SPINAL CORD AND SPINE, SURGERY OF.

K. W. Monsarrat, F.R.C.S.

Fractures of the Transverse Processes.—Tanton[1] draws attention to this important lesion, practically unknown till radiography demonstrated it. (This refers to fractures of transverse processes uncomplicated by more extensive vertebral lesions.) They may implicate a single transverse process, but they are more frequently multiple, and particularly concern the second, third, and fourth lumbar vertebræ. They usually occur from direct violence, but according to Tanton may also be due to muscular contraction. Pain is practically the only symptom ; it is usually localized, but occasionally radiates to the coccygeal region, to the abdomen, or down the sciatic nerve. Movement increases it, particularly flexion of the trunk forwards and flexion laterally away from the injured side. Some cases that are looked upon as muscular contusions are undoubtedly of this nature. The prognosis is good, but even in cases where there is no suspicion of simulation, the pain may persist for several years. In these cases it may be justifiable to remove the fractured processes, particularly if there is union in distinct deformity.

Spina Bifida.—Heile[2] writes on the surgical treatment of spina bifida complicated by hydrocephalus. He remarks on the frequency of failure by the usual methods ; either there is persistent discharge of cerebrospinal fluid, which invariably leads to infection, or while the operation is successful the cerebrospinal fluid continues to be secreted and hydrocephalus becomes established. In such cases repeated puncture has been the practice, but even with the most careful precautions infection sooner or later leads to meningitis.

Recent work on permanent subcutaneous drainage for hydrocephalus led the author to devise a method of permanent drainage into the peritoneal cavity for infants with spina bifida. He reports a case in which he carried out this plan. A child two days of age presented a myelocystocele in the lumbar region. The cyst was tense and threatened to rupture ; when it was compressed the fontanelles were distended and convulsive movements were set up ; evidently the spina bifida and hydrocephalus were in communication with each other. The

child was placed face downwards with the pelvis elevated; the meningeal sac was exposed and in part resected; then the peritoneal cavity was opened immediately to the outer side of the longitudinal muscles on the left. Six strands of silk were introduced, one extremity being placed in the peritoneal cavity, the other in the meningeal canal. The wound was then closed by sutures. For ten days the child was kept in the same position, and at the end of six weeks recovery from the operation was complete. Some time afterwards a little pustule formed near the cicatrix, and from this two strands of silk were extracted. The child was six months of age at the time of report; the spina bifida was cured, there was no symptom of hydrocephalus, intelligence appeared normal, and the general condition was excellent.

Heile concludes that capillary drainage of the cerebrospinal fluid into the peritoneal cavity is a method likely to give satisfaction, and that in his case the child can be considered cured.

Acute Vertebral Osteomyelitis.—This disease is often obscure in its first stages, as the local phenomena may be latent compared with the constitutional disturbance, which is usually marked from its commencement. It is a comparatively rare lesion, and clinical examples are worth notice.

Gundermann[3] reports the case of a man, aged twenty-eight, who developed symptoms following a boil on the neck, with violent pain in the back; the localization was at first quite indefinite. A febrile lesion was only suspected when swelling appeared in the region of the spines of the seventh and eighth dorsal vertebræ which, when punctured, yielded drops of turbid fluid. After the application of wet dressings the swelling disappeared, but a left pleural empyema developed and was evacuated. This operation brought the temperature down, but the vertebral lesions continued to advance, and an angular curvature rapidly developed in the region of the seventh, eighth and ninth dorsal vertebræ. About this time the patient began to expectorate a large quantity of pus, and for this reason, and because of the persistence of a fistula at the site of the incision, it was decided to perform a second operation, resection of a further portion of the seventh rib, with part of the sixth and eighth; it was then possible to reach the vertebral bodies and curette them. Marked general improvement followed, although the fistula persisted and small sequestra came away from time to time. The chief interest of the case lies in the complications in the pleura and lung which were set up by the vertebral lesion, and the good results which followed a direct attack on the vertebral disease.

Gaudier and Bertein[4] write on *osteomyelitis of the sacrum.* They consider that the lesion has certain peculiarities which mark it off from other acute vertebral inflammations, in particular its very rapid development, the pronounced symptoms of intoxication with which it is associated, and the rarity of cord complications. Injury seems to have a marked influence in determining the onset. It is in the lateral masses that the process is most active, but it may reach the sacrum from a lesion in the ilium. It tends to diffuse over a considerable area,

and the collections of pus that form extend backwards usually, but may accumulate in front, bulging towards the rectum, or make their way downwards through the sciatic foramina towards the great trochanter. Occasionally they pass round to the brim of the pelvis and appear in the thigh in front. The disease runs a rapid course, and death may occur within a few days of onset; diagnosis must be early if treatment is to be effectual. Occasionally a subacute case is met with, and then difficulty will arise in occluding tuberculosis of the sacro-iliac joint and the hip joint; exploratory puncture and bacteriological examination will be of assistance. In the more acute disease energetic treatment is necessary, and attempts should be made to expose the whole of the area involved.

Spinal Cord.—A number of clinical records of *extramedullary spinal tumours* which have appeared call for no special comment, except that they demonstrate the increasing frequency of successful diagnosis and removal.

Hildebrande[5] contributes a general article with many interesting points. He first asks whether *injuries of the spinal column with cord lesions* should be operated on, and is in favour of making operative interference the general rule. He is also in favour of operation within the first few days. He relates four cases of operation for injury of the cervical spine, in two of which there were signs of complete cord destruction, the cord lesion being partial in the other two. Three were operated on the day after the accident, and died shortly after from œdema of the lungs; the fourth case, with a partial lesion operated on sixteen days after the accident, improved temporarily but died four months later. In five cases of injuries to the dorsal vertebræ, there were signs of a complete transverse lesion of the cord in four. Operation was performed from fifteen to twenty-five days after the accident; in three cases there was relative improvement, with death at the end of a year. In one case with signs of a complete lesion, the paralysis of the sphincters disappeared and there was a slight return of voluntary movement; at this operation the spinal cord was found greatly reduced in volume; the patient recovered from the operation, and was alive two and a half years afterwards, but the lower limbs remained paralyzed. In the one dorsal case with an incomplete cord lesion, the symptoms were greatly improved by operation, but the patient died three and a half months after from urinary troubles. A tenth case of vertebral injury concerned the lumbar spine; operation showed extensive lesion of spinal roots, and marked improvement in voluntary movement followed, but vesical symptoms persisted and the patient died a year after the operation.

The second question that Hildebrande puts is whether operation should be performed for *paralysis secondary to tuberculous spinal disease.* He has operated on ten such cases. In five, localized masses of tuberculous granulation tissue were found in the spinal canal; in the remainder, the cord was surrounded and compressed by diffuse granulation tissue. In the former he considers that no improvement

in the paralysis is to be expected by extension, but it is impossible to diagnose this particular lesion, and in all cases operation is only to be advised after orthopædic methods have failed. Among the ten cases four showed no improvement ; in four others the lesions were more or less improved ; in one the cord symptoms disappeared but the vertebral tuberculosis continued to progress ; in one only was a complete recovery obtained. This complete success concerned a child with paralysis of the lower limbs and of the sphincters due to compression by a small tuberculous mass the size of a nut, which was extirpated, and the patient made a permanent recovery. The other nine patients died after an average period of a year, but in none was death due to the operation.

Hildebrande has operated on seventeen cases of *tumour* referred to him from the Neurological Clinic ; in three of these, complete operation was impossible, the tumour being intramedullary in two and too extensive for removal in the third. Of the fourteen cases remaining, four succumbed, two in consequence of the operation, one from otitis, and another from the hæmorrhage of a duodenal ulcer. Of the ten patients who survived, five were completely cured ; these were cases of endothelioma and sarcoma. One of the patients with sarcoma had no recurrence after two and a half years.

In six patients the author had carried out *intradural section of the posterior spinal roots* : in three for intense syphilitic neuralgia of the upper limbs, in one for neuralgia due to cancerous metastases. In two cases roots were cut in the lumbar region, once for neuralgia in the right thigh, once for spasmodic contracture. In two children suffering from Little's disease, the two first sacral and three last lumbar roots were cut. In this series improvement was generally obtained, but not complete relief.

Hildebrande's method of laminectomy is as follows : a longitudinal incision is made alongside the spinous processes, together with transverse incisions above and below ; the vertebral spines are reflected to one side, attached to the overlying soft parts. At one end of the operation this osteo-muscular flap is reapplied.

The summary of his results is as follows : Forty-eight laminectomies on forty-six patients. In ten traumatic lesions four patients succumbed to the operation. In ten tuberculous cases no patient succumbed. In twenty tumours two patients died from infection and collapse, and three were inoperable. In seven root resections one patient succumbed

Resection of the Posterior Roots. — As described in the *Medical Annual*, 1911, this operation has been undertaken for the relief of spasm, for the visceral crises of tabes, and for pain. Küttner[6] has published ten examples of resection for the spasmodic contraction of Little's disease. All recovered from the operation, and the author does not consider the risks grave. The technique he recommends is as follows : The patient is placed face downwards and laminectomy is performed. Küttner considers osteoplastic procedures complicated

and useless. The laminectomy extends from the twelfth dorsal to the first sacral, and it is preferable to terminate the first stage of the operation after this resection and to complete it later. In order to recognize the different roots, the anatomical point noted by Förster is made use of; that is to say, that the first sacral root corresponds to the fifth lumbar spinous process. At the level of this spine a suture is passed through the skin to one side of the middle line, and used as a guide after opening the dura. Küttner resects the posterior roots of the second sacral and the fifth, third, and second lumbar. After the roots have been cut, the dura mater is closed by a continuous suture of fine silk, drainage being avoided.

Post-operative treatment is of the greatest importance. The lower limbs should be placed in extension, abduction, and outward rotation at the hip, extension at the knee, and dorsiflexion at the ankle. This position is maintained by a plaster apparatus which is removable for exercises. These should be commenced early, and a great deal of patience is necessary in educating the patient. It may also often be necessary to correct tendinous contraction by tenotomy, but this should not be done at an early stage after the root operation. Küttner considers Förster's operation of great value in marked and resistant cases of Little's disease, but he remarks that failure is certain unless the after-treatment is conducted with the greatest care and patience.

Van Gehuchten[7] has proposed to modify Förster's operation with a view to lessening the gravity of the operation itself. His proposal is to expose the termination of the spinal cord, and to resect, not the posterior roots, but certain bundles of the fibres going to form posterior roots close to their emergence from the substance of the cord. For this purpose it is sufficient to resect the laminæ of the last two dorsal vertebræ and the first lumbar, but in the child the second lumbar laminæ also. The operation was carried out in two cases by Lerat. In the first case it consisted in the bilateral resection of three small root bundles belonging to the posterior roots of the lumbar and sacral nerves; the result was satisfactory. In the second case also, three bundles containing three or four fibrils each were resected on each side. The patient died, twenty days after the operation, of broncho-pneumonia, and there was also flaccid paralysis of the lower limbs. After death it was found that spinal meningitis had supervened. A third operation was performed by Devos after the same fashion. In order to make the resection more precise a ligature was placed on the root bundles it was proposed to resect before any were actually cut. The operation was successful in that a considerable diminution of the spastic condition of the muscles resulted. It is not clear in this contribution how the author proposes to identify the root bundles which are to be dealt with. The procedure appears to lack precision in this respect, and in default of further information on this point, the reduction in operative trauma seems to be outweighed.

Abbe[8] advises operating at one stage, although previously an advocate of the two-stage method. He also favours the hemi-laminectomy

devised by Taylor. He considers it advisable to cut only the half or three-fifths of each root, this being sufficient to destroy reflex spasm without interfering with motor functions. He draws attention to the observations of Sherrington that complete resection of the posterior roots abolishes voluntary movement in the limbs, although excitation of the cortex shows that normal muscular sense still remains. Abbe prefers this technique to that of Förster, who recommends leaving intact some of the roots and completely resecting about two in every three.

Förster[9] gave a summary of the published results in a paper read before the Royal Society of Medicine. He dealt with cases of resection for the *gastric crises of tabes*. The following is the tabular list :—

TWENTY-FIVE CASES OF GASTRIC CRISES (22 SURVIVED ; 3 DEATHS). 20 SUCCESSFUL (2 NOT BENEFITED).

		Interval between operation and publication.
No relapse, 13 cases	Küttner	5 months.
	,,	1½ years.
	Haan	7 weeks.
	Goetzel	3 months.
	Becker	3 ,,
	Guleke	2 ,,
	Noone	Interval not stated.
	Sänger	
	Sick	
	Franke	
	,,	
Relapse, 7 cases	Sauerbruch	
	Tietze-Förster	
	Guleke	

He further summarizes the cases in which the lesion was *spastic paralysis* due to disease of the cortico-spinal path. He considers that only lesions with real reflex spasticity are suitable, not diseases of the type of chorea, athetosis, mobile spasm, and spasmodic torticollis, though possibly Parkinson's disease might be suitable. He further states that good results can only be obtained with very careful after-treatment by exercises. It is necessary to place the limb in removable splints to correct the previous deformity.

SIXTY-ONE CASES OF SPASTIC PARALYSIS (56 SURVIVED ; 5 DEATHS).

37 cases of congenital spastic paraplegia (Little's disease) : 36 successful ; 1 not benefited.
3 cases of acquired cerebral spastic paraplegia : all successful.
4 cases of spinal spastic paralysis of traumatic origin : 2 successful ; 2 not benefited (1 case wrong roots divided, 11 Th., 12 Th., 1 L. ; 1 case complete interruption of the cortico-spinal tracts).
1 case of spastic paraplegia from compression of the spinal cord (Pott's disease) ; successful.
2 cases of syphilitic spastic paraplegia (Erb) : successful.
1 case of primary spastic paraplegia (? Erb-Charcot) : successful.
2 cases of disseminated sclerosis : 1 case not benefited ; 1 case successful, disease rapidly progressing, death.
7 cases of spastic paralysis of the arm : 5 cases benefited ; 2 cases not successful—complete interruption of the cortico-spinal tract.

Hey Groves[10] reported six cases of posterior root resection at the same meeting. In the first case the operation was done for pain. The third, fourth, and fifth lumbar, and the first, second, and third sacral roots were resected ; the result was fairly satisfactory, and the patient described himself eighteen months after, as having suffered much less pain than previously. The second case was for the pain of a large indolent ulcer over the left shin. The patient desired amputation. The posterior roots of the fourth and fifth lumbar, and the first, second, and third sacral roots, were resected without any good result. In the third case, for tabetic crises, the patient died about a month after the operation. The three remaining cases were for spasm, with a fairly satisfactory result in each.

Circumscribed Serous Meningitis.—A more complete knowledge of this lesion is greatly to be desired in view of the good result which may be expected from an early operation. We now know that associated with certain affections of the cord, and following certain pathological conditions of the meninges, circumscribed collections of serous fluid may form and be responsible for profound alterations in the conductivity of the cord and for pressure effects revealed by sensory and motor abnormalities.

The *causes* of this condition are trauma and certain infections, in particular influenza and gonorrhœa. The lesions which result produce adhesions in the arachnoid, leading to the formation of closed pockets ; in these a fluid collects and compression phenomena are produced. When the dura mater is exposed in such a case, it is found distended, bluish in colour, and pulsation is absent or hardly perceptible. When it is opened, bluish semi-transparent masses herniate through the opening, and incision into this gives exit to a clear yellowish or brownish fluid.

The *symptoms* of the condition are very like those of tumour, differing because of the slow accumulation of the fluid and its occasional comparative diffuseness. At the commencement they are usually unilateral, and become bilateral later, being for the most part sensory : numb pains in a part or a whole of a limb, with a burning sensation not usually limited to the distribution of a single root ; anæsthesia, either total or partial, varying from time to time, associated with hyperæsthesia, which also is a varying distribution. Motor symptoms take the form of paralysis or pares s, sometimes flaccid and sometimes spastic, with increase of the reflexes. The sphincters are usually not affected. The main difference from tumour symptoms lies in the variability of the phenomena observed, even after quite a short interval of time.

Weisenburg and Müller[11] report a case of a woman, aged twenty, who fell on her hip whilst skating ; the fall produced some local pain for a few days. A year afterwards she complained of numbness and sensations of burning on the front and internal aspect of the right thigh ; these symptoms increased, and extended to the whole thigh and leg. At the end of another year the pains were continuous, and

motor symptoms made their appearance : first slight weakness in the leg, and then the complete failure of certain movements. The area of anæsthesia and hyperæsthesia varied from week to week, but the eleventh and twelfth dorsal, and first, second, and third lumbar nerves were those concerned. Operation was decided upon, and the canal was opened over the ninth, tenth, and eleventh dorsal vertebræ. A meningeal pocket was discovered, out of which fluid escaped on incision. The patient recovered.

References.—[1]*Rev. de Chir.* 1910, 1101 ; [2]*Berl. klin. Woch.* 1910, 2298 ; [3]*Deut. zeit. f. Chir.* 1911, 121 ; [4]*Rev. de Chir.* 1911, 238 ; [5]*Arch. f. klin. Chir.* lxxxiv, 203 ; [6]*Beitr. z. klin. Chir.* 1910, 393 ; [7]*Bull. de l'Acad. de Méd. Belgique*, 1910, 860 ; [8]*Med. Rec.* 1911, i, 377 ; [9]*Lancet*, 1911, i, 76 ; [10]*Ibid.* 79 ; [11]*Amer. Jour. Med. Sci.* 1910, 719.

SPIROCHÆTOSIS. *Leonard Rogers, M.D., F.R.C.P.*

L. Bousfield[1] reports on cases of *relapsing fever* among soldiers in the Sudan, the disease having apparently been contracted during leave in Egypt. Both bed-bugs and pediculi vestimentorum were found associated with the cases, but the infection is believed to have been conveyed by the latter, as first proved by Mackie in India. Spirochætes were demonstrated in the blood. Andrew Balfour[2] carried out some experimental work in connection with Bousfield's cases, but it was much restricted for want of time. He infected a gerbil or desert mouse and also a monkey, but sub-inoculations failed and the strain was lost. The incubation period in the monkey was five days. Lice were fed and examined, but no spirochætes were found in them, great difficulty being met with in keeping them alive. He thinks that the form of fever in south Oran is a special one due to a specific parasite and similar to the Egyptian ; but more extended observations are necessary on this point. He also records[3] further work on the *spirochætosis of Sudanese fowls*, first described by him. He has now found that the intracorpuscular forms arise from granules discharged from the periplastic sheath of the spirochætes, as can be seen by dark-ground illumination. They can be stained by the Yamamato modification of the Levaditi process. These granules are a resistant form, and they are present in such great numbers in the tissues, that they may possibly account for the relapses in fevers due to this class of organism.

References.—[1]*Jour. R.A.M.C.* 1910, ii, 444 ; [2]*Ibid.* ; [3]*Jour. Trop. Med. and Hyg.* 1911, 113.

SPOROTRICHOSIS. *E. Graham Little, M.D., F.R.C.P.*

Diagnosis.—Now that at least two,[1] and perhaps three,[2] cases of sporotrichosis have been reported in England, the question of its diagnosis has assumed practical importance for all of us.

Sutton[3] contributes an interesting clinical study, based on four cases, in each of which the diagnosis was verified by microscopical examination. Rats and mice appear to be among the commoner animals most susceptible to the infection. The organism grows on all ordinary

media, both acid and alkaline in reaction ; 28° is the optimum temperature ; grape-sugar added to the media used increases luxuriance of growth, but this is often slow under even favourable conditions. Smears from the affected area may reveal the pressure of the characteristic *sporothrix*, showing a branching septate coarse mycelium carrying ovoid bodies (spores).

Treatment. — This was to **Incise** the tumours, which were then cauterized with 90 per cent of **Phenol,** and dressed with moist dressings ; internally, **Arsenic and Iron** with **Iodide of Potassium** were prescribed. Cure usually resulted within from three to four weeks.

Harker[4] notes that the disease is " fairly common " in the Mississippi valley, and endorses Sutton's statement that " a traumatic lesion of the arm, forearm, or leg, which proves resistant to ordinary surgical treatment, and is accompanied by the development of one or more sharply circumscribed, painless, cutaneous or subcutaneous abscesses along the course of a limb, should always arouse suspicion, especially if the inflammatory manifestations characteristic of a streptococcic cellulitis are absent." He reports a case, not however confirmed microscopically, in which complete cure resulted within four weeks, after treatment with **Potassium Iodide.**

Walker[5] and Ritchie give a general *résumé* of the subject, and record a case, the second seen in this country (if v. Ofenheim's[6] is regarded as doubtful), which occurred in a working man as the result of a trifling injury which began to " fester," refused to heal, and was followed by others in lymphatic continuity. Cultures proved the presence of sporothrix. These could be grown on all the ordinary media, and especially well on Sabouraud's maltose agar. The organism is definitely aerobic ; microscopically, filaments crowded together and bearing spores are seen. In six mice hypodermically inoculated with culture grown on potato, subcutaneous nodules developed in ten days, and the sporotrichon isolated from the nodule ; in the tissues, mycelium does not seem to form. It is probable that there is a large group of sporotricha with a widespread distribution on decaying vegetable matter ; and other cases of this kind are certain to be recorded. Attention should be especially directed to lesions resembling syphilis and tubercle, but not altogether to be identified with these.

References.—[1]*Brit. Jour. Dermat.* 1911, 182 ; [2]*Lancet,* 1911, Mar. 11 ; [3]*Bost. Med. and Surg. Jour.* 1911, Feb. 9, and *Jour. Amer. Med. Assoc.* 1911, May 6 ; [4]*Ibid.* ; [5]*Brit. Med. Jour.* 1911, ii, 1 ; [6]*Lancet,* 1911, Mar. 11.

SPUTUM. *O. C. Gruner, M.D.*

Antiformin Method.—Boardman[1] reports on several methods of using antiformin, and points out its advantages. Antiformin is composed of sodium hydroxide 5 per cent with an unknown quantity of sodium hypochlorite. The only bacilli which resist antiformin (i.e., are not dissolved by it) are those of the acid-fast group. The method consists in placing the entire twenty-four hours' sputum in a conical glass, and adding an equal volume of distilled water if the

material is thick. Antiformin is added in volume equal to one-fourth that of the diluted sputum. After stirring, the mixture is allowed to stand for an hour, and an equal volume of 95 per cent alcohol is added. The mixture is again stirred, and allowed to stand for from two to twenty-four hours. The supernatant fluid is then poured off, and the deposit smeared on to a glass slide which has already been smeared with a thin film of the original sputum. The slide is then stained in the usual way. A centrifuge will hasten the work. Boardman points out that in this method tubercle bacilli may be simulated by acid-fast rods which are probably fat needles. These are larger and straighter than the tubercle bacillus, and readily transmit light. The finding of two or three bacilli is sufficient for a positive diagnosis.

Proteid Reaction.—Gantz and Hertz.[2] The sputum is treated with acetic acid (30 per cent), in order to precipitate mucin, nucleo-albumin, food particles, and blood. Ten c.c. of sputum are treated with 10 c.c. of distilled water and 2 c.c. of glacial acetic acid, and the mixture is beaten with a glass rod inserted through a hole in a piece of paper placed over the vessel. It is then filtered, and a very faintly opalescent fluid is thus obtained. This filtrate is boiled, and it will become turbid at once if the reaction is not sufficiently acid. Usually it is necessary to add potash drop by drop before turbidity or precipitate will appear. Occasionally a few c.c. of saturated salt solution may need to be added before the positive reaction is obtained.

Results.—Tuberculosis gives a positive result except in the fibroid forms. Fibrinous pneumonia, gangrene of the lung, and exudative pleurisy give positive results. Heart disease, nephritis, and chronic bronchitis give a negative result, unless there are complications such as œdema of the lung (which gives a positive). In other diseases a positive result is usually to be attributed to œdema of the lung. It is thus seen that the proteid reaction may be useful in practice, especially in cases of suspected early tuberculosis of the lung, where tubercle bacilli have not been found.

References.—[1]*Johns Hopkins Hosp. Bull.* 1911, 269; [2]*Berl. klin. Woch.* 1911, 285.

STAMMERING. *Purves Stewart, M.D., F.R.C.P.*

Stammering is a habit-spasm which occurs chiefly in persons of nervous constitution. The affection consists essentially in a want of co-ordination between the vocal, laryngeal mechanism and the consonantal, oral mechanism. The commonest type of stammering is that in which the patient sticks at a consonant, on which he strains with misplaced energy before he can let it go and proceed to enunciate the rest of the word. In other words, he misdirects his energy on the consonants instead of touching them off lightly and passing on to the vowel sounds. Stammerers rarely fill their lungs properly, and a large part of the successful treatment of stammering consists in teaching the patient proper respiratory exercises, and especially in insisting upon a good method of voice-production, for most stammerers at once

lose their stammer when they sing. A rarer variety of stammering is that in which the patient sticks at initial vowels. This is due to misuse of the laryngeal muscles, whereby the false vocal cords are spasmodically contracted, and the patient sticks with open mouth until the spasm relaxes, when the words pour out in a rapid stream until his breath is exhausted. He then takes another breath, and once more the initial spasm occurs, followed by the precipitate rush.

TREATMENT.—Makuen[1] emphasizes the fact that the stammering habit is an acquired one. Speech is an acquired faculty, and stammering is an acquired defect. Children of nervous heredity are specially liable to acquire the habit of stammering, not only from members of their own family, but from playmates and school-companions. It is important to prevent stammering by careful training at the earliest threatening of the affliction. If the home surroundings of the incipient stammerer are unfavourable by reason of an exciting environment or of the presence of other stammerers, a special school or a special teacher of elocution should be secured, and respiratory, phonatory, and articulatory exercises should be given. By such means a tendency to stammering may often be nipped in the bud. But in most cases the habit is already fully developed before the patient comes under skilled treatment. In such cases the stammerer has often lost hope as to the possibility of his cure, and has formed the opinion that he is essentially different from other people. Moreover, he is impatient of discipline, and in a hurry to get well without perseverance or sustained effort on his own part. To whom shall such a patient turn for cure? "Certainly not," says Alexander Graham Bell,[2] "to any pretender who veils his method in convenient secrecy, nor to any who profess to 'charm' away the impediment or to effect a cure in a single lesson! Not to any whose 'system' involves drawling, sniffing, whistling, stamping, beating time, all of which expedients have constituted the 'curative' means of various charlatans; nor to any who bridle the mouth with mechanical appliances—forks on the tongue, tubes between the lips, bands over the larynx, pebbles in the mouth, etc., etc. The habit of stammering can only be counteracted by the cultivation of a habit of correct speaking, founded on the application of natural principles. But with the best assistance, the stammerer must work out his own cure. He cannot be passive in the matter. He must clearly apprehend the principles on which he is to proceed, and diligently apply them. Nor must he in this depend too much on the watchfulness of his instructor, but must learn to watch over himself. His perfect release from the habit will require time, patience, and hopeful, energetic effort." If the stammerer lacks the faculties of attention or concentration, he must be trained to acquire and to strengthen these faculties. If he has become markedly introspective and self-conscious, he must be shown how to overcome these defects. In other words, as Makuen says, he must learn to control himself before he can hope to control his speech.

As to the precise method to be employed in the training of any individual stammerer, it must be one which includes not only voice-culture and respiratory exercises, but a careful training of the patient in the mechanism of speech. This can be attained best under the supervision of an experienced teacher. The patient thus learns to use his larynx as a musician does an instrument, acquiring skill and proficiency by well-directed exercises and steady practice. Amongst the exercises, the first and most important are those which direct the patient's efforts to his breathing and vocal mechanism. As we have already pointed out, the singer rarely stammers. Having learned to fill his chest properly with air, and to phonate in a good resonant voice, the patient must be carefully trained in the physiological alphabet, and whenever he shows a fault in the articulation of a particular consonant, he must at once be stopped, his error explained to him, and suitable exercises prescribed to overcome it. Later, after practising test-sentences in a good round voice, he should be drilled in phonetic reading and recitation. He should be taught to regard his organ of speech as an instrument apart from himself, on which he has to learn to play, just as a musician does on any other instrument. Facility of speech is thus gradually attained, and with this he obtains self-confidence. The fear of stammering often lurks in his mind after the cure is apparently complete; hence the value of encouraging suggestions by the physician.

REFERENCES.—[1] *Jour. Amer. Med. Assoc.* 1910, Sept. 3; [2] "*Mechanism of Speech*".

STOMACH, CARCINOMA OF. *Robert Hutchison, M.D., F.R.C.P.*

DIAGNOSIS.—We are still searching for some certain test by which we shall be able to detect carcinoma of the stomach in its earliest stage, when radical cure by operation is yet possible. All the tests hitherto introduced with this object have proved disappointing, but two years ago Neubauer and Fischer[1] introduced a new one—the so-called **Glycyltryptophan Test.** In the words of Weinstein,[2] who has suggested a modification of it, the following is the rationale of this test:—

Our food, as such, cannot be assimilated by the system. In order to be absorbed, most food substances must be converted into simpler cleavage products. Thus proteins, to be absorbed by the system, must go through a series of changes, until they reach the simplest grade. This series of changes for coagulable proteins, such as albumin, is: (1) acid metaprotein, (2) primary proteoses, (3) secondary proteoses, (4) peptones, (5) "polypeptids," and finally (6) amino-acids. Amino-acids are the simplest cleavage products into which proteins must be broken up for assimilation by the body. The hydrolytic cleavage of the proteins into amino-acids is effected by the digestive enzymes. There are numerous amino-acids, such as glycin, alanin, leucin, tyrosin, tryptophan, etc., each exhibiting characteristic properties. In a normal stomach the digestion of proteins is never carried

to the amino-acid stage. It is only in the intestines that extended hydrolysis into amino-acids occurs.

Various investigators have shown that cancerous tumours elaborate a certain enzyme which exhibits strong proteolytic powers, and which is capable of converting proteins as well as simple peptids into amino-acids. Although benign tumours, as well as other somatic tissues, possess similar properties, their peptid-cleaving powers are rather weak—they never equal the powerful peptidolytic action of malignant growths. Neubauer and Fischer have contrived to utilize this fact in their test for cancer of the stomach. They used glycyltryptophan for this purpose. Glycyltryptophan is a dipeptid which consists of a union of glycin and tryptophan radicals.

In making their test, Neubauer and Fischer add filtered stomach contents to a solution of glycyltryptophan. The mixture is then placed in a thermostat for about twenty-four hours. At the end of that time a test is made for the presence of tryptophan. If tryptophan is found, it means, according to Neubauer and Fischer, that an enzyme present in the stomach contents has converted glycyltryptophan into glycin and tryptophan. Such a result could not be due to normal constituents of stomach contents, e.g., pepsin, rennin, lipase, or hydrochloric acid, since these agents do not, under gastric conditions, split either dipeptids or proteins into amino-acids. An enzyme capable of converting glycyltryptophan into glycin and tryptophan occurs in gastric contents only in cases of malignant growths of the stomach.

Weinstein regards the test as a valuable one, but admits that it is inconstant and that he cannot say whether it occurs in *early* carcinoma.

Walker Hall and Scott Williamson[3] apply the test in the following modified way :—(1) An Ewald test breakfast is given on a presumably empty stomach, and withdrawn one to two hours later. It is best to syphon off the contents and to avoid any undue manipulations with the tube. Much intragastric movement may lead to reflex regurgitation of duodenal fluids. (2) The stomach contents are filtered. The residue and filtrate are tested for the presence of blood, bile, trypsin, and tryptophan. If any of these are present the material is discarded. (3) One part of the filtrate is added to a solution of glycyltryptophan (supplied by A. & M. Zimmermann), covered with toluol, and incubated for twelve, twenty-four, or forty-eight hours at 38° to 40° C. (4) A second portion of the filtrate is incubated for the same period with the addition of toluol, but without the dipeptid (control for tryptophan formed during incubation). (5) A tube containing glycyltryptophan and toluol is also incubated at 38° to 40° C. for twelve to twenty-four hours (control for free tryptophan in the polypeptid solution). (6) To each portion of the incubated filtrate and the control a mixture of bromine water 3 parts, and acetic acid (5 per cent in water) 1 part, is added drop by drop. In the presence of free tryptophan, a lilac colour develops when a sufficiency of bromine water is added. This colour disappears when bromine is present in excess, the mixture becoming yellow in colour.

In the absence of free tryptophan the fluid assumes a pale yellow tint.

The writers state that the results they have obtained from the test have been "somewhat striking," but admit that further investigation is needed before the real value of the method can be determined. Hermann Ley[4] and Pechstein,[5] who have also studied the test clinically, both come to the conclusion that it is untrustworthy.

Graham[6] has investigated the alterations of the **Hydrochloric Acid** in the gastric juice due to carcinoma of the stomach, and sums up as follows:—(1) Carcinoma of the stomach causes definite changes in the amount of the active acid and mineral chlorides present in the gastric contents. (2) The increase in the mineral chlorides may be an earlier sign of carcinoma than the diminution of the active acid. (3) These changes can be observed in the great majority of cases. (4) This condition can be accounted for by the secretion of an alkaline fluid in the stomach, which neutralizes the acid. (5) The alkaline fluid is most probably secreted by a malignant growth which has begun to ulcerate.

For **X-ray** diagnosis, *see page* 67.

REFERENCES.—[1]*Deut. Arch. f. klin. Med.* 1909, 97, 499; [2]*Jour. Amer. Med. Assoc.* 1910, Sept. 24; [3]*Lancet*, 1911, Mar. 18; [4]*Berl. klin. Woch.* 1911, Jan. 16; [5]*Ibid.* 1911, Feb. 27; [6]*Quart. Jour. Med.* 1911, Ap.

STOMACH, FUNCTIONAL DISORDERS OF.

Robert Hutchison, M.D., F.R.C.P.

Atonic Dilatation.—Mitchell[1] describes a new method of treatment in this condition. The radical cure is to restore the motor function of the stomach and to re-educate it to perform its work automatically as it does under normal conditions. The instrument essential for the carrying out of the treatment is a modification of the phonendoscope. It is a large, fairly heavy instrument (not less than 8 oz.) called Bazzi et Bianchi's, and when placed on the abdomen (the patient recumbent) leaves both hands of the operator free.

Let the patient lie flat on his back, with the head well down, and place the phonendoscope on the epigastrium, where its weight holds it in position; introduce the two ear-pieces into the ears and proceed to percuss out the stomach, liver, colon, intestines, etc. It will be found that by this method the organ can be mapped out with the greatest accuracy, and less difficulty will be experienced in distinguishing the stomach from a dilated colon or small intestine. Without the instrument it is often impossible to differentiate a dilated colon from the stomach. The slightest degree of splash, inaudible without the instrument, can now be detected. Grasp the patient firmly by both hands, steady the instrument with the tips of the thumbs, and sharply shake. The splash is quite clear. Another method is, with the instrument in the same position, with the right hand sharply press under the margin of the ribs, when a splash is easily obtained. By means of this instrument certain definite sounds can be heard, and it is essential that the

physician should train himself to differentiate these and learn their significance :—" Pistol-shot sound " : small successive quantities of gas passing through the pylorus. " Explosion sound " : large quantities of gas passing through the pylorus. " Sizzling sound " : small quantities of fluid passing through the pylorus. " Gushing sound " : larger quantities of fluid passing the pylorus. " Débacle " : a long-continued rush of fluid occurring towards the end of the treatment, when the stomach completely empties itself into the duodenum. " Waves " : (*a*) A low " crunching sound " resembling that made by a man walking on frozen snow, due probably to the churning movements of the antrum. (*b*) A soft " sighing sound," heard only in an empty stomach across which peristaltic waves are passing. These are not obtained except at the very end of a treatment.

The point on which the whole treatment turns is the discovery of a series of superficial skin areas, the gentle stimulation of which causes contraction of the distended stomach, the opening of the pylorus, and consequent emptying of the contents into the duodenum. It is a pure reflex action. The areas lie along the margin of the ribs, commencing at the tip of the tenth costal cartilage on the left side, ascending to the tip of the sternum and down the costal margin on the right side.

The manipulation is carried out as follows. With the patient flat on his back, place the phonendoscope on the right of the umbilicus and seat yourself on his right side facing his head. Place your right hand on the patient's abdomen with the tips of the fingers at the costal margin, find the tip of the tenth rib, and with the tips of the first, second, and third fingers very gently glide, with a trembling motion, over the skin. A hard tap produces a spasm of the pylorus, and all attempts to empty the stomach are futile for some time. It is the delicate, light touch which is efficacious. After a few seconds or minutes (it varies), action will be heard beginning in the stomach. The first to leave is always gas ; consequently " pistol-shot " or " explosion sounds," according to the quantity escaping at one time, will be heard. Cease the stimulation until that contraction has stopped, then proceed again in the same manner, and all the gas will thus be driven out. Then quite different sounds can be heard : a low, muttering, crunching sound begins ; it increases in intensity as it approaches the pylorus, and, this opening, a sizzling or rushing sound of fluid is heard. These waves succeed one another until the stomach is quite empty, and when there is nothing more left, the soft blowing sighing sound can be heard, as wave after wave travels across the empty stomach.

In " atonic dilatation " it is difficult to start the contractions, but once started they continue very well. There is always in this condition a great deal of gas in the stomach, and before the fluid can pass the pylorus this gas must be expelled. Owing to the weakness of the muscular coats there is very little strength in the contraction, and very frequently the sound heard is a characteristic one ; it suggests a " ball-valve," the accumulation of gas in the pyloric antrum moving up to the pylorus, but not escaping, and making a curious metallic snap as it

is forced against the closed pylorus. When, as is always the case after a little time, the gas escapes through the pylorus, it does so with a very loud report, and is followed by a rush of fluid.

In a case of atonic dilatation the treatment for the restoration of the motor function of the stomach is carried out as follows. About five hours after a meal, say at six in the afternoon, the treatment as described above is performed. At the first treatment great patience is required, and usually half an hour or more is necessary to completely empty the stomach. This routine is carried out daily, and at the end of two or three weeks the actual symptoms and signs of dilatation have subsided. It is necessary to continue the daily treatment until at six in the afternoon, after an ordinary luncheon, there is no sign of splash, distention, or retention of food ; in other words, the stomach carries out its motor function without any external aid. It is necessary, in order to prevent a relapse, that the treatment be continued daily until the sounds heard are normal—viz., smooth, regular, intermittent waves, and the passage of fluid through the pylorus at every second or third wave. If there is a great deal of gas, or if the waves are broken, irregular, and choppy, then the stomach is still abnormal, although the patient may feel perfectly well.

Certain points in the treatment are of importance. Once a wave is heard to commence, the stimulation should be stopped until that wave has ceased. If further stimulation is commenced before the previous wave is completed, a spasm of the pylorus is apt to occur. The treatment should not be commenced until at least four hours have elapsed since a meal, and in the graver cases an even longer time. If a case is a particularly obstinate one, it is better not to try to force it, but to leave the stomach perfectly quiet for an hour, and then recommence the treatment.

The contractions produced by this method are often very powerful, and it is of the utmost importance that this treatment should not be used when a real " gastric ulcer " is present. This ulcer involves all the coats of the stomach, and a very powerful contraction might produce either perforation or violent hæmorrhage.

Alimentary Hypersecretion.— This disorder, first described by Straus,[2] consists in an abnormally large secretion of gastric juice during digestion only, and is thus distinguished from continuous hypersecretion, in which the stomach contains gastric juice even in the fasting state. It is commonest in males, and is not distinguished by any symptoms other than those met with in any case of " nervous " dyspepsia, except that the patients exhibit a great diminution of weight, 10 to 15 lb. being a not uncommon loss ; this is ascribed to loss of gastric secretion. The disease is much like atony, and Boas believes that there can be no question that it has in many instances been mistaken for atony or nervous dyspepsia. To determine the presence of this condition, Boas advises a dry test meal. As bread contains 35·5 per cent of water, he utilizes Albert cakes, containing but 8·9 per cent of water. If five Albert cakes are given as a test meal and removed

from the stomach at the end of an hour, but a small residue will be recovered under normal conditions. In digestive gastrosuccorrhœa, however, 100 to 200 c.c. of fluid may be obtained. On standing, it forms into two layers, a lower layer, slight in amount, precipitated to the bottom, and above a clear or slightly cloudy fluid, three or four times as large in amount. On examination the secretion generally shows a total acidity and a percentage of free hydrochloric acid not above and often below normal. Boas found in a large proportion of cases a total acidity of from 40 to 56, and free hydrochloric acid 35 to 45, which indicates that while in this condition there may be no excess in the acid of the gastric secretion, the secretion is greatly increased in quantity. In other words, there is a hypersecretion, but no hyperacidity. The average specific gravity of the gastric juice is 1012. The secretion presents a more or less marked biuret and sugar reaction, while albumin is not present; erythrodextrin, amidulin, and also the amylum reactions are usually marked. By means of the dry diet the diagnosis is made positive. If the bottom layer of the secretion is large, there must be a motor disturbance present at the same time.

Zweig[3] has reported further observations in this condition. He attributes the most prominent symptom of the disorder, loss of flesh, not to the loss of gastric juice, as pointed out by Boas, but to the fear of eating due to the great discomfort produced by the ingestion of food. He also calls attention to the marked constipation attendant upon this disorder, and also to the fact of the great variability of symptoms, the best of health being enjoyed for weeks, to be followed by days of marked discomfort due often to psychic influences, such as sorrow, excitement, etc. A very frequent symptom is the splashing sound produced over the area of the stomach, which is often considered a sign of atony of the stomach. This sound is really devoid of any diagnostic value regarding the condition. It should, however, attract attention at once to the possibility of a digestive gastrosuccorrhœa. Zweig investigated eighteen cases, employing the Sahli method; in the remainder of his cases he utilized the Ewald-Boas test breakfast. He found that under normal conditions the amount of solid sediment is from 40 to 60 per cent of the total sediment, while in alimentary hypersecretion the amount of solid sediment is always under 30 per cent, while the fluid contents amount to from 70 to 93 per cent. Zweig also points out that even in those cases in which the total amount of gastric contents is not increased, but in which these relations of the solids to the liquid exist, an alimentary hypersecretion must be assumed. In his investigations, Zweig placed the gastric contents into test-tubes, graduated in cubic centimetres, 20 cm. in length and 3 cm. in diameter; these were centrifugalized and the amount of sediment determined. If the entire quantity of solid sediment after a test breakfast is over 77 c.c., Zweig considers that the alimentary hypersecretion is accompanied by a motor insufficiency. In his 18 cases 10 presented hyperacidity, 2 subacidity, and 6 normal acidity. The specific gravity

is always reduced ; instead of the normal 1015 to 1020, the values are reduced to 1007 to 1012.

Friedenwald[4] and Austin[5] describe several cases of this form of hypersecretion, their results corresponding very closely with those of previous observers.

Treatment. — This is largely that of nervous dyspepsia. As most patients have lost much flesh and strength, the best results are obtained by means of the **Rest Cure.** Ordinarily the **Diet** should consist of three meals a day, as all food ingested has a tendency to increase the gastric secretion. The nourishment should contain an excess of proteins and fats and a small proportion of carbohydrates. Of the proteins, milk, eggs, and fish are to be preferred, as they do not tend to increase the gastric secretion as much as meat. Fats decrease the acid of the gastric secretion, and are therefore highly recommended ; they should be given as butter, cheese, cream, and olive oil. The carbohydrates should only be allowed in the most digestible forms, as vegetables in purée form, dextrinized flour, and stale bread and toast. The quantity of fluids ingested need not be decreased. Large quantities of milk and alkaline waters may be taken with benefit. Such food as bouillon, meat extracts, coffee, tea, and alcohol, as well as all acid and spiced foods, should be avoided. The **Alkalies** with or without **Belladonna** or its preparations are often serviceable, and it is needless to point out that such measures as **Hydropathic** procedures, **Massage,** etc., which have a tendency to build up and strengthen the nervous system, are of great service.

Hyperchlorhydria.—Russell[6] is convinced that in hyperchlorhydria we have a definite clinical entity, capable of exact diagnosis and highly amenable to treatment. The symptoms of so-called " acid dyspepsia " (burning pain at the cardiac orifice, acid eructations, water-brash, etc.) are really due to excess of hydrochloric and not of organic acids.

In other cases there is a sense of dragging or weariness, referred to the stomach, or a *hunger-discomfort,* coming on two hours or less after breakfast perhaps, and removed by taking a glass of milk, a drink of cold water or soda water, or a cup of tea. In other cases, and more commonly somewhat later in life, much gastric discomfort or definite pain comes on from one or two hours after a meal ; and this is associated with mental depression, and great difficulty in, amounting in some instances to complete incapacity for, mental or physical effort. The misery of the hyperchlorhydric leads him to reduce and reduce his feeding in the hope of freeing himself from his depression, and he becomes thin and haggard in appearance. Sometimes he gets relief by vomiting ; more commonly he does not vomit. He often gets relief by the eructation of some mouthfuls of very acrid stuff. His pain lasts for an hour or two, and if it lasts up to his next meal, the taking of it relieves him for some time, the duration depending upon the composition of the new meal. Some patients tell you that they relieve their symptoms by taking sodium bicarbonate, others by taking milk or by drinking water.

On removing the gastric contents, they are found to be intensely acid and to contain much free HCl. The contents consist of a slightly opalescent fluid, and a deposit consisting almost entirely of the remains of farinaceous food giving a strong starch reaction, and microscopically made up of starch grains and granules. No trace of milk curd, white of egg, or fish or flesh fibre may be found, although the finding of the latter depends upon the amount of these foods taken at the previous meal, and the time which has elapsed before the stomach contents are withdrawn. The retention of broken-down cereal food in an intensely acid fluid is the usual characteristic of the material removed from the stomach, when the symptoms are present in these cases.

That this hyperacid fluid in the stomach is the cause of the pain and depression is proved by the immediate relief of the symptoms when it is withdrawn. A like effect is produced by a sufficient dose of an alkali, and the best is probably **Bicarbonate of Soda,** without peppermint. The symptoms are also promptly relieved by taking milk or raw egg. Whenever in fact the free acid is sufficiently diluted, fixed in combination with proteid, neutralized by an alkali or removed mechanically, complete relief is obtained.

The dietetic treatment depends upon various considerations—mere reduction in quantity may be sufficient. Speedy relief may be obtained by a proteid dietary which can be rapidly digested and is not too highly seasoned. As regards drugs, sodium bicarbonate not only counteracts the free HCl, but, as Pawlow has shown, it inhibits acid secretion. For the inhibition of secretion various drugs can be used, but **Belladonna** stands at the head of the list.

Pylorospasm.—Einhorn[7] says that spasmodic contraction of the pylorus can exist for a short period of time and disappear, or it can make its appearance quite frequently and last a long while. Rarely pylorospasm exists without any apparent cause (idiopathic form). More frequently, however, this condition is secondary, and due to organic affections in the neighbourhood of the pylorus (ulcers of the stomach or duodenum, gall-stones, etc.).

It is a frequent affection, which in its first stages is often overlooked. The principal symptoms are pains in the epigastric region, sometimes radiating more to the right side of the abdomen. Vomiting may exist. In the severe forms peristaltic restlessness is encountered, and the pylorus may occasionally be palpated and felt as a smooth oval tumour.

The *diagnosis* from an organic stricture of the pylorus is not always easy. The rice test (a rice meal given in the evening and followed by gastric lavage in the fasting condition the following morning) will always show the presence of almost the entire quantity of rice in the stomach in a case of fully developed organic stenosis of the pylorus. In pylorospasm, however, the rice test will show different results at different times, sometimes the entire quantity being found, while at others only a small amount is recovered, or nothing at all.

Einhorn has invented a dilator by which he says that cases of functional pylorospasm can be cured without operation. The instrument, however, is not one for general use.

REFERENCES.—[1]*Lancet*, 1911, Jan. 28; [2]*Deut. Arch. f. klin. Med.* 56, 120; [3]*Arch. f. Verdauungstr.* 1907, 13, 143; [4]*Amer. Jour. Med. Sci.* 1910, Sept.; [5]*Boston Med. and Surg. Jour.* 1911, Jan. 19; [6]*Brit. Med. Jour.* 1910, Dec. 31; [7]*Med. Rec.* 1911, Jan. 21.

STOMACH, SURGERY OF.

John B. Deaver, M.D.
D. B. Pfeiffer, M.D. } *Philadelphia.*

Gastro-Enterostomy.—It is desirable that the indications be clearly understood in order that delay with its frequently disastrous sequels be obviated, and, but little less important, that its contraindications be determined in order to avoid the chagrin and dangers attendant upon unnecessary and unsuccessful operation. These considerations render of the greatest value individual reports of personal observations of the results of cases in which the nature of the disease was well disclosed and the subsequent course carefully followed. Bamberger has studied 836 cases in which operation was performed for ulcer of the stomach. In last year's *Medical Annual* Bettman and White's contribution was noted, in which the end results in 150 cases of more than one year's duration were given. Dunham[1] now makes a report of forty-eight cases personally observed. Twelve patients died within seventeen days of operation, and three later. Of the three deaths after an interval, two were due to cancer and one to recurrent hæmatemesis, morphinism, and asthenia, none being chargeable in any way to the operation. Of the twelve who died before convalescence was established, one was due to intercurrent gangrenous appendicitis, one to perforation and peritonitis, one to peritonitis, two to hæmatemesis, five to shock, and two to vicious circle. The cases date back to 1903. Since 1905 there has been no case of vicious circle, an experience which coincides with the advancement of operative method and has rendered this complication almost extinct. Of the other fatal cases, Dunham, who was not the surgeon himself in any case, says that surgical treatment should have been given much earlier in eight. Two should not have been operated at all, as no stenosis was found. The problem of reduction of mortality therefore becomes one of earlier treatment and of fitting the operation to the case.

The following outline shows results in the entire series of twenty-seven patients known to be alive:—

Ulcers of stomach or duodenum with stenosis (21):—	
Perfect recovery	14
Recovery (care required as to choice of food)	4
Improved	2
Unimproved	1
Ulcers of stomach or duodenum without stenosis (3):—	
Perfect recovery	1
Improved	1
Unimproved	1

Nervous dyspepsia (2) :—	
Unimproved	2
Atony with dilatation (1) :—	
Unimproved	1
Total	27

He concludes that hyperchlorhydria as a symptom of chronic gastric ulcer is inconstant and should be disregarded. Perfect recovery may occur when atony of the stomach has existed before the development of ulcer and motor insufficiency persists. Many of the fatalities would have been averted had the family physician made a diagnosis before serious complications developed. Forty patients in the series gave a history of ulcer covering five years or more before the diagnosis was made. Pylorectomy offered a better prognosis for recovery in five of the fatal cases. Three patients were lost from hæmorrhage from the ulcer areas, and two died as a result of carcinomatous transformation of the pyloric ulcer. The legitimate field for gastro-enterostomy in benign diseases of the stomach is in chronic ulcers near or below the pylorus with stenosis.

An annoying, though fortunately infrequent, sequel of gastro-enterostomy is ulceration at the junction of the stomach and jejunum or in the jejunum itself, the so-called *gastro-jejunal and jejunal ulcers*. We have observed one case in which two perforations of the jejunum occurred at an interval of some months following recovery from perforated duodenal ulcer for which primary gastro-enterostomy was done. Wilkie,[2] in Caird's clinic at Edinburgh, reports three cases, and sums up as follows :—

Two types of jejunal ulceration must be distinguished, the one—gastro-jejunal—in which the ulceration occurs at the site of the anastomosis ; the other—true jejunal ulceration—in which one or more ulcers form in the jejunum at some distance from the anastomotic opening. In the great majority of cases the ulceration has occurred at or close to the gastro-jejunal anastomosis. The ulceration may manifest itself at any period after the gastro-enterostomy, from a few weeks to several years. The formation of the ulcer is usually associated with a recurrence of the gastric symptoms, but in some cases symptoms of perforation have been the first evidence. The tendency to perforation is apparently greater than in the case of gastric ulcer, and the death-rate from such perforation is high.

In all recorded cases, the preceding gastro-enterostomy had been carried out for the relief of a *non-malignant* affection of the stomach or duodenum. Jejunal ulceration has been met with after every variety of gastro-enterostomy, but it occurs probably more frequently after an *en* Y type of anastomosis than after the simpler forms of operation. In the majority of cases, but not in all, the preceding gastric lesion had been associated with hyperacidity. The jejunal ulceration is probably caused by the action of the acid gastric juice on the jejunal mucosa, which, under normal conditions, is exposed to an alkaline medium.

From a series of animal experiments, he finds that hyperacidity of the gastric contents will not of itself bring about the ulceration in the jejunum after gastro-enterostomy. Union of the cut edges of the gastric and jejunal mucous membranes, after gastro-enterostomy, takes place by granulation, taking on an average seven days to be complete. Marked hyperacidity of the gastric contents, trauma, e.g., from solid food passing over the granulating area, and the presence of an unabsorbable suture in the granulating area, tend to delay repair.

Some absorbable material, such as catgut, should be used for the inner suture. Chronic gastro-jejunal ulcer in the human subject is probably due to a failure of the gastro-enterostomy wound to heal completely, owing to any of the causes mentioned above. In cases in which gastro-enterostomy has been performed, functional closure of the pylorus may be simply and effectively brought about by one or two suitably-placed Lembert sutures.

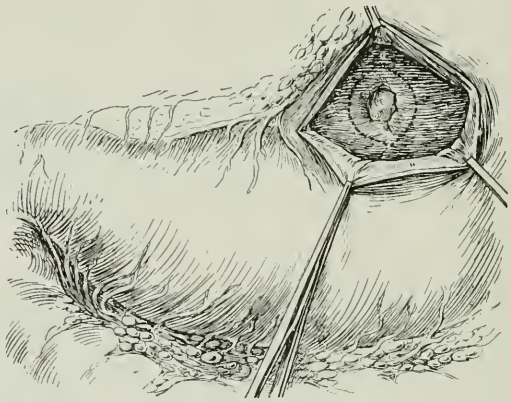

Fig. 105.—Transgastric excision of calloused ulcer of the posterior wall of the body of the stomach, showing anterior wall of the stomach open and the ulcer exposed. The dotted lines show proposed site of excision.

Excision of Chronic Ulcers. — In the treatment of "calloused" ulcers of the stomach which do not lie in the pyloric region, gastro-enterostomy often proves disappointing in the relief of symptoms, and fails to obviate the pronounced tendency to malignant transformation. There has been, therefore, a growing sentiment in favour of excision of ulcers of this type. For ulcers lying in the pyloric end the Rodman operation is efficient, i.e., partial gastrectomy with complete closure of the end of the duodenum and stump of the stomach and independent gastro-enterostomy. For those lying in the anterior wall of the stomach excision offers no special difficulty, and if mechanical conditions are introduced thereby which threaten the motor function, a gastro-jejunostomy should be done as a separate procedure. Occasionally cylindrical resection may be indicated.

Fig. 106.—Ulcer excised, and the through-and-through mucous suture partially completed.

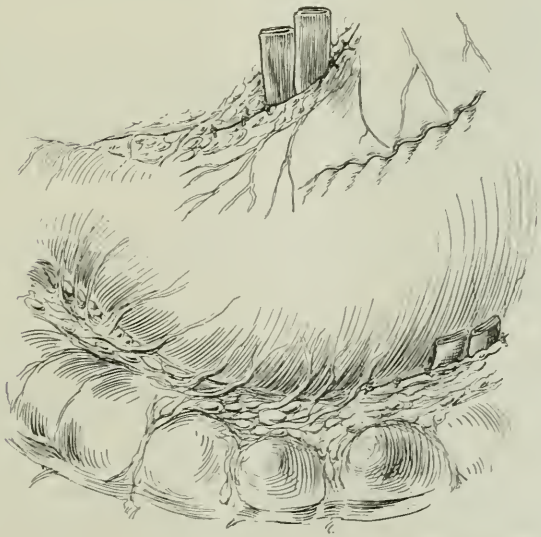

Fig. 107.—Anterior wall of the stomach sutured. Rubber-tissue drains in place.

Ulcers situated in the posterior wall of the stomach are difficult of access, and for such W. J. Mayo[3] advocates transgastric excision. He has performed this operation five times without leakage or evidence of infection, and with the recovery of the patient in each instance. The steps of his operation are as follows: The gastrohepatic and gastrocolic omenta are opened above and below the ulcer. Gauze protection is introduced, adhesions are carefully separated, and, if possible, the ulcer surface is cut free from the posterior attachments without opening the stomach. A piece of gauze is packed into the denuded area behind, and in all cases but one this temporary pack was adequate to stop hæmorrhage without the ligation of vessels. The anterior wall of the stomach is opened, and with the fingers behind, the entire ulcerated surface is pressed through the anterior incision and the ulcer excised (*Fig.* 105). The gap is sutured with through-and-through sutures of chromic catgut from the mucous side transversely, and this suture line is further protected by several mattress sutures of linen, applied from the mucous side to prevent separation due to the early absorption of the catgut (*Fig.* 106). The anterior wall of the stomach is then closed. Several rubber-tissue drains are carried down behind the stomach and brought out at the upper end of the abdominal wound as a safeguard (*Fig.* 107).

REFERENCES.—[1]*Jour. Amer. Med. Assoc.* 1910, ii, 1777; [2]*Edin. Med. Jour.* 1910, Oct.; [3]*Ann. Surg.* 1910, Dec.

STOMATITIS.

(*Vol.* 1910, *p.* 45)—The local application of chemically pure **Methylene Blue** has been recommended for the treatment of various kinds of stomatitis.

STRABISMUS. (*See* OCULAR MUSCLES.)

STREPTOTHRICOSIS. *Leonard Rogers, M.D., F.R.C.P.*

R. G. Archibald,[1] working in Khartoum, has found in several tumours presenting characters commonly associated with Madura foot disease, infection by the *Botryomyces ascoformans*. He thinks the parasite is really a streptothricosis.

REFERENCE.—[1]*Brit. Med. Jour.* 1910, Oct. 1.

SYCOSIS.

(*Vol.* 1910, *p.* 550: *Vol.* 1911, *p.* 578)—**Vaccine** treatment gives good results in the staphylococcal cases. A useful local application is **Ether** 2 parts with **Oil of Wintergreen** 1 part.

SYPHILIS. *C. F. Marshall, M.D.*

Cultivation of the Spirochæta Pallida.—Noguchi[1] claims to have made cultures of the spirochæte. Two strains of *Spirochæta pallida* in pure culture inoculated into the testicle of the rabbit gave rise to typical lesions containing numerous spirochætes. The author concludes that the *S. pallida* can thus be made to grow in pure culture, and that these cultures are pathogenic for the rabbit. Further, the testicular lesions thus produced in the rabbit are identical with those set up by syphilitic material.

Diagnosis.—*Serum Diagnosis.*—At a recent meeting of the British Medical Association, Professor Wassermann[2] opened the discussion on the diagnostic use of the complement fixation method. After briefly describing the history of the reaction and its technique as applied to syphilis, he mentions that the discovery that an alcoholic extract of normal non-syphilitic organs would give a reaction with the majority of syphilitic serums, led many observers to use extracts of normal organs or even lipoids and lecithin as antigen, instead of extracts of syphilitic organs, on the assumption that nothing more is present in the latter than the former, since in most cases of acquired syphilis the serum usually gives corresponding results with both extracts. This assumption, however, is erroneous, for extracts of normal organs lack those substances formed by cell degeneration resulting from spirochætal activity.

Dean, investigating the relationship of idiocy to congenital syphilis, found that the serum of such patients never gave the reaction with an absolute extract of normal organs, but reacted typically with an aqueous extract of syphilitic organs. Hence, the latter is the more scientific and reliable antigen, and should always be used in scientific and responsible researches. As regards the modifications of his original technique, introduced to make the reaction more sensitive, Wassermann remarks that he purposely chose a method that should not be too sensitive. It is a less evil for a few syphilitics, in whom there is only a slight amount of antibodies, to give a negative reaction, than for a non-syphilitic to give a positive reaction, for the former cases can be tested again ; also, syphilis should not be excluded because of a single negative reaction. None of the modifications of the original reaction, such as Noguchi's, are recommended by Wassermann, on account of their being too sensitive. A diagnosis of syphilis should not be made unless nearly all the red corpuscles remain undissolved ; partial arrest of hæmolysis is not sufficient. As regards the specificity of the reaction, when carried out under the precautions originally recommended it is specific within the limitations that apply to all immunity reactions. The serum of patients infected by agents closely related to the spirochæte (yaws and recurrent fever), will give a similar reaction. Considering the close relationship between spirochætes and trypanosomes, as well as other protozoa, organisms which all have the characteristic property of liberating lipoids from the body cells, it is not surprising that protozoal diseases in certain stages should show a similar reaction. The most important of these is malaria, and it has been shown by Meier that malarial patients give the reaction as long as the parasites are in the blood. Hence, in testing malarial patients for syphilis, an interval of three months should elapse since the last malarial attack. Wassermann also advises an interval of a month after any acute febrile infectious disease. If these precautions are taken, a positive reaction signifies syphilis. On the other hand, if the reaction be negative, syphilis cannot be excluded absolutely, but only with a probability of about 90 per cent. The

reaction is important in latent syphilis, especially as cases of general paralysis and aortic disease occur in latent syphilitics who have not lost the reaction.

As regards the *influence of treatment* on the reaction, in the majority of recent cases the reaction can be made to disappear by mercurial treatment. When the reaction recurs symptoms appear soon afterwards, so that the reaction is the forerunner of the relapse. If, however, the infection is many years old, it becomes so stable that mercurial treatment has no effect on it. In general we may say that after vigorous mercurial treatment, about 20 per cent only retain the reaction. Wassermann concludes that any form of treatment which will cause persistent disappearance of the reaction, will protect against the worst sequelæ of syphilis, such as tabes, general paralysis, and aortic disease.

After reviewing all the facts, Muir[3] considers the deviation in the Wassermann reaction cannot be held to depend on the presence of an antigen in the strict sense, but is to be regarded as an example of fixation of complement by a mixture of organic compounds.

As regards the diagnostic value of the reaction, Browning[4] points out that, while a positive reaction may indicate that the individual is syphilitic, it does not prove that the lesion in question is syphilitic. This caution is necessary for instance in lesions of the tongue, where epithelioma often supervenes on syphilitic leucoplakia. As regards the effect of treatment on the reaction, energetic mercurialization begun early and long continued restores the serum to its normal condition. Early commencement and long duration of treatment are important factors in converting a positive into a negative reaction. A positive reaction in a latent case is an indication for further treatment. A positive reaction in a mother who has borne an apparently healthy child is an indication for treatment of the child also. The question remains as to the value of the reaction in determining the duration of treatment. The reaction may be positive when symptoms are absent. This may be due to lesions of the internal organs, but not always, as the virus is known to remain alive (in monkeys) for a long time without producing obvious changes in the tissues. At the same time the spirochætes may pervert tissue metabolism so as to lead to premature senescence without obvious lesions. It is best to regard a positive reaction as a sign that gross effects are liable to occur at any time, and hence as an indication for further treatment.

Ivy McKenzie[5] states that in a case of chronic nervous disease, if the blood gives a positive reaction the disease may be syphilitic, or it may be a non-syphilitic disease occurring during a latent stage of syphilis. But if the cerebrospinal fluid is also positive, we may conclude that there is syphilitic affection of the nervous system. A negative spinal fluid with a positive blood test does not necessarily exclude syphilis of the central nervous system. If, however, the blood is negative, general paralysis may almost certainly be excluded. In

this way, general paralysis may be differentiated from chronic alcoholism, plumbism, and post-traumatic psychosis.

McKenzie also favours the view that tabes and general paralysis are due to the syphilitic virus itself, and states that there is evidence to suggest that localization of syphilis in the nervous system may be due to the nature of the virus; some infections causing degeneration of bone and viscera, while others attack the nervous system. Paucity in numbers and difficulty in staining may explain the hitherto fruitless attempts to find the spirochæte in parasyphilitic lesions.

Keyes[6] does not place absolute reliance in the Wassermann reaction in the diagnosis of syphilis, and remarks that even in the hands of the most expert it is far from being a constant criterion of the presence or absence of syphilis. He considers that syphilis is quite as eccentric in its serum reaction as in its clinical manifestations. In some cases a positive reaction persists for months, and yet no symptoms appear. The reaction can only be depended on for diagnosis in untreated secondary syphilis. In tertiary syphilis it is useful only by way of confirmation. Neither is a negative reaction certain evidence that the disease is latent or cured. However, the reaction is, generally speaking, quite as accurate as the various tuberculin reactions, and may be employed with great advantage if used only to confirm an opinion already formed on clinical data.

Moutot[7] also remarks that the results obtained by the Wassermann test have not always an absolute clinical value, especially as regards cure. He has several times seen a negative reaction in undoubted cases of untreated syphilis. As regards a positive reaction, independently of the cases in which it may occur apart from syphilis, it would appear that it only signifies the existence of previous syphilis, not necessarily of syphilis in evolution.

Reuben[8] has investigated the Wassermann reaction in *hereditary* syphilis, and comes to the following conclusions: (1) The most usual mode of transmission of syphilis to the fœtus is through the placenta. If the infant is syphilitic, the mother is also syphilitic; the father may or may not be so. (2) Mothers with no symptoms of syphilis but who give birth to syphilitic children, have latent syphilis; 71 per cent of such mothers give a positive reaction. (3) Mothers with symptoms of syphilis who give birth to syphilitic children give a positive reaction in 72 per cent of cases. (4) The earlier the blood is examined after birth of the last syphilitic child, the greater the percentage of positive reactions; 90 per cent within one year, 40 per cent within four years. (5) The great majority of infants of syphilitic mothers are themselves syphilitic. (6) Infants with hereditary syphilis give a positive reaction in 99 per cent of cases. (7) Mercury and salvarsan change a positive reaction to a negative. (8) These drugs do not cure syphilis, but transform active into latent syphilis. (9) The blood of every wet nurse should be examined; if positive, she should not be employed; and if negative, her infant should be tested. (10) Seventy-

five per cent of all conceptions of syphilitic mothers result in death of the infants within a year.

Craig and Nichols[9] have studied *the effect of alcohol on the Wassermann reaction*. They find that alcohol, when taken in considerable quantities possesses the power of rendering the strongest positive serum negative, and that this negative reaction persists for a few hours to several days. From the practical point of view, their observations show that a negative reaction in persons who have taken considerable amounts of alcohol within twenty-four hours of the withdrawal of blood, cannot be depended upon.

TREATMENT.—Pedersen[10] points out that the treatment of syphilis should not be routine, but varied according to the individual peculiarities of the patient. As regards the different methods of **Mercurial** treatment, he regards ingestion as the most convenient, but probably the least effective. Of the various preparations for ingestion, he considers the following the best, in order of merit—mercury and chalk, bichloride, tannate, and cyanide ; of less merit, calomel, biniodide, and protoiodide. He recommends **Alkalies** and digestive aids, such as **Pepsin** and **Pancreatin,** to be given with the above. **Inunction** is efficient but difficult to carry out properly. **Fumigation** would be the ideal method but for the fact that it requires special apparatus. He thinks **Injection** the best method of treatment, and prefers **Salicylate of Mercury.** Under mixed treatment he includes mixtures of mercury and arsenic as well as mercury and potassium iodide, and prescribes these two mixtures on alternate weeks. Mercury should be given in all stages of syphilis, as it is up to the present time the one fully established curative measure against the disease. Pedersen is of opinion that the necessity for periods of rest during treatment has been exaggerated, and that the indication for a period of rest lies, not in any theoretical rule, but in the signs of the effect of the drug on the patient. He therefore gives treatment continuously, till there is some indication to suspend it, and finds that the average patient has about one month's rest from treatment during the year. With regard to the ultimate results of treatment by **Salvarsan,** he wisely remarks that this question remains for the next twenty years to decide. The value of **Asurol** as a vehicle for mercury is referred to on *page 7* ; for **Mercury Colloid** *see page* 25.

Hectine.—Felix Dive,[11] writing on the treatment of syphilis by hectine (benzol-sulphone-para-amino-phenyl arsenate of sodium, an organic preparation of arsenic introduced by Mouneyrat in 1908), comes to the following conclusions. Hectine is the least toxic of all the arsenical compounds used in syphilis. Applied locally, in the form of solution, powder, or ointment, it has a powerful kerato-plastic action. Internally it may be given in the form of solution or pills without causing disturbance of the alimentary canal. Subcutaneous injections never cause nodosities or acute inflammatory reaction, and can therefore be made around circumscribed lesions, such as chancres, as in Hallopeau's abortive treatment. During treatment by hectine, the red and white

blood cells increase as well as the amount of hæmoglobin, and the general health is improved. The curative action is very rapid on chancres, secondary eruptions of the skin and mucous membrane, headache, tertiary lesions of the gummatous, ulcerative, or sclerous type, and on nervous lesions. The action is slower on papular, miliary, and psoriasiform syphilides. When given by the mouth, ·1 gram is a moderate daily dose ; by injection, ·2 gram daily is a strong dose. In children, doses of ·03 gram, ·05 gram, and ·1 gram may be given by ingestion or injection, according to age. In sucklings, ·01 gram to ·03 gram is enough. Whatever the mode of administration, 2 grams constitute a course of treatment. Diminution of visual acuity indicates suspension of treatment. Hectine should be given with caution in old people with arteriosclerosis. It may be given alternately with mercurial injections, or may be combined with mercury in the form of **Hectargyre,** a combination of hectine with oxycyanide of mercury. This is especially useful in tertiary and in malignant syphilis.

Abortive Treatment.—In a communication to the Paris Academy of Medicine, Hallopeau[12] recently advocated a method of treatment by which he claimed that syphilis could be aborted, provided the treatment was commenced within the first twenty days of primary syphilis. This treatment is based on the idea that syphilis remains localized throughout the primary period, and that it is possible to destroy the spirochætes in their initial distribution. The treatment consists in local daily injections of **Hectine** (20 centigrams) (which Hallopeau considers better than any other organic preparation of arsenic) into the chancre itself or the adjacent tissues, and into the track of the lymphatics leading to the satellite glands. These injections are continued for thirty days. In addition to this, intensive general treatment is given in the form of daily injections of **Benzoate of Mercury** (2 centigrams), combined with the internal administration of **Iodide of Potassium** (2 grams daily). The injections of hectine are said to cause no local or general troubles. Hallopeau mentions 14 cases treated in this way by himself and others, in which no secondary symptoms occurred and the Wassermann reaction remained negative ; in one case the syphilis dated eighteen months, and in six others about a year. He also states that Dr. Moniz de Aragao, of Brazil, has applied this method to 127 cases of primary syphilis, which are said to have been aborted. This observer used **Atoxyl** and **Arsacetin** instead of hectine. Hallopeau says that **Hectargyre** may also prove valuable for the local injections, the dose containing 10 centigrams of hectine and 2 milligrams of oxycyanide. As a measure of prudence, the abortive treatment is continued for thirty days, but according to Hallopeau there is reason to believe that two weeks of local treatment and thirty days of constitutional treatment are sufficient. Further specific treatment is said to be unnecessary, and Hallopeau goes so far as to state that his method "enables us to cure in a month all cases of syphilis that have been dealt with during the first thirty days, provided the chancre be accessible to injections."

On the other hand, Jambon, Moutot, and Augagneur[13] report two cases in which the above treatment failed to prevent secondary syphilis. In the first case the chancre dated three to five days; in the second case ten days. Both cases were treated with daily local injections of 20 centigrams of hectine for thirty days. In one case the secondaries appeared three months, and in the other three and a half months after treatment was commenced. Moutot[14] has since reported another case in which the chancre was fourteen days old. In spite of the abortive treatment, secondary syphilis developed about two and a half months after the chancre.

Cacodylate of Sodium.—The use of this drug in the treatment of syphilis has been revived by Murphy,[15] who reports good results after the injection of one to two grains, intramuscularly, in cases of primary, secondary, and tertiary syphilis, especially in ulceration of the palate. He states that the spirochætes disappear from primary chancres in twenty-four hours, the induration of the chancre and corresponding adenitis subside in a few days, that lesions of the mucous membrane heal quickly, and that an ulceration of the palate which had resisted mercurial treatment soon began to heal after injection of cacodylate of sodium. In fact, he reports similar results to those claimed for salvarsan, without the dangerous effects of the latter. Suggett[16] obtained no good effect in cases of primary and secondary syphilis, even after a series of ten injections of 3 grains. However, in a case of syphilitic hemiplegia, the use of the limbs was almost restored after 27 injections of 3 grains, and a case of severe congenital syphilis in an infant aged 13 months improved greatly after 15 injections of $\frac{1}{4}$- to $\frac{1}{2}$-grain doses, hypodermically, during a period of nine weeks. Suggett also mentions a case of tertiary syphilis of the throat which rapidly improved after one injection of 6 grains. He concludes that the results obtained from cacodylate are indifferent in primary and secondary syphilis, but good in tertiary and congenital cases; but there is a want of uniformity in results, and much larger doses may be indicated. Schirrmann[17] and Crigler[18] also report good results from the injection of sodium cacodylate in cases of cerebral and malignant syphilis respectively. (*See also page* 10.)

Salvarsan.—As dioxydiamidoarsenobenzol, or "606," now known as salvarsan, has been tried in several diseases, it is comprehensively dealt with elsewhere in this issue of the *Medical Annual* (*page* 37). As regards syphilis, it may be briefly stated here that, although salvarsan has a rapid healing action in certain cases, there is no evidence that it has a curative effect on the disease, and most authorities recommend a supplementary course of prolonged mercurial treatment. The comparative value of salvarsan and mercury in the treatment of syphilis has been fully discussed elsewhere by Major French,[19] and the present writer.[20]

The effect of **Novoiodine** on venereal ulcers is referred to on *page* 26; **Ocean Sanatorium** treatment is also dealt with on *page* 26.

REFERENCES.—[1]*Jour. Amer. Med. Assoc.* 1911, i, 102; [2]*Brit. Med. Jour.*

1910, Nov. 5; [3]*Ibid*; [4]*Glasg. Med. Jour.* 1910, Nov.; [5]*Ibid*; [6]*Jour. Cut. Dis.* 1910, Sept.; [7]*Ann. des Mal. Vén.* 1911, Sept; [8]*Arch. Ped.* 1911, June; [9]*Jour. Amer. Med. Assoc.* 1911, i, 474; [10]*N.Y. Med. Jour.* 1911, Nos. 17 & 19; [11]*Thèse de Paris*, 1910; [12]*Bull. Acad. de Méd.* 1910; [13]*Lyon Méd.* 1911, Feb. 28; [14]*Ann. des Mal. Vén.* 1911, Sept; [15]*Jour. Amer. Med. Assoc.* 1910, Sep. 24; [16]*N.Y. Med. Jour.* 1911, Ap. 8; [17]*Ibid*; [18]*Jour. Amer. Med. Assoc.* 1911, Mar. 25; [19]*Lancet*, 1911, July 18; [20]*N.Y. Med. Jour.* 1911, July.

SYPHILIS, CONGENITAL. *G. F. Still, M.D., F.R.C.P.*

Wood[1] states that 5·1 per cent of the out-patients at the Children's Hospital in Melbourne were found to be suffering from syphilis; but he points out that there are many more in whom the disease shows itself only by indirect symptoms, such as marasmus, debility, etc., and in whom the health is more or less undermined by the syphilitic taint, although the child may survive. As showing the ravages of congenital syphilis, he mentions that in five families affected by this disease there were twenty-one dead children in addition to miscarriages, and only twenty-seven survivors. He mentions also instances in which idiocy or mental enfeeblement occurred amongst some of the survivors.

Box[2] considers that *cerebral palsies*, both ante-natal and post-natal, may be due to congenital syphilis; and that this cause may be determined by the Wassermann test applied to the blood or to the cerebro-spinal fluid. His observations seem, however, rather to confirm the rarity of this cause than to prove any special frequency of syphilis in the spastic paralyses of childhood.

J. D. Rolleston[3] draws attention to blueness of the sclerotics in association with congenital syphilis. This peculiarity, which sometimes runs in families, is associated in some cases with fragilitas ossium. It is not known that it bears any special relation to congenital syphilis. The relation of syphilis to juvenile general paralysis of the insane is, according to Davidson,[4] so well defined that it seems to support the idea that general paralysis is in all cases syphilitic. He quotes statistics showing that cerebral affections are by no means infrequent in congenital syphilis, and states that statistics of imbeciles in New South Wales showed a specific taint in 10·7 per cent.

TREATMENT.—Wood[1] insists upon the danger of unduly short anti-syphilitic treatment. When mercury has cleared away the immediate manifestations of the disease, parents are only too apt to consider further treatment unnecessary. He would insist upon one year of continuous treatment with **Mercury,** and a second twelvemonths of intermittent treatment.

There is at present but little experience to hand of the treatment of congenital syphilis by "606," and indeed it hardly seems likely that this method, accompanied, as increasing experience in the case of adults seems to show, by serious dangers of its own, will ever come into frequent use for the congenital disease. The results of mercurial treatment, if administered with sufficient vigour, are so thoroughly satisfactory, even in such serious lesions as the eye affections, that nothing further, certainly nothing which inflicts as much

discomfort, not to say risk, as the injection of "606," seems desirable. (*See also* SALVARSAN, *page* 37.)

Gibson[5] says that he invariably treats *interstitial keratitis* with mercury only, and with no local treatment except atropine if required. It may be necessary to use **Inunction** in order to obtain a rapid mercurialization, and for this purpose it may be necessary to repeat the inunctions for several days, **Ung. Hydrargyri** being rubbed in over a different area of skin each day.

REFERENCES.—[1]*Trans. Australas. Med. Congr.* 1908, iii, 16; [2]*Brit. Med. Jour.* 1911, i, 982; [3]*Brit. Jour. Child. Dis.* 1911, 202; [4]*Trans. Australas. Med. Congr.* 1908, iii, 242; [5]*Id.* 74.

SYRINGOMA. *E. Graham Little, M.D., F.R.C.P.*

Ormsby[1] describes a case of a nearly generalized nodular eruption in a woman aged 23. Histological examination of an early nodule showed a dense cell mass in the corium and dipping into the hypoderm, apparently round a coil-gland. The coil-duct could be traced from the epidermis into one of those masses of cells which were shown to be epithelial cells apparently derived from a proliferation of sweat-duct cells. Clinically the patient suffered from diminution of sweating and increased frequency of micturition; the urine presented no abnormality; it was carefully examined by Webster while the patient was specially dieted.

REFERENCE.—[1]*Jour. Cutan. Dis.* 1910, 433.

SYRINGOMYELIA.

X-ray treatment (*page* 75).

TABES.

Pains relieved by **Adalin** (*page* 2).

(*Vol.* 1910, *p.* 24)—**Desalgin** will, it is stated, relieve the lightning pains. (Other drugs that may be useful are **Antipyrin, Aluminium Chloride,** and **Pyramidon**).

TACHYCARDIA, PAROXYSMAL.

(*Vol.* 1909, *p.* 137)—Herz's plan of treatment is a simple one. The patient, seated in a chair with his head thrown well back, swallows a small quantity of water. This provokes eructation and checks the attack.

TENDONS, INJURIES OF. *Priestley Leech, M.D., F.R.C.S.*

Rupture of Supraspinatus Tendon.—Codman[1] reports two cases of this accident. Incomplete rupture of the supraspinatus tendon is more common than complete rupture, and when the sensitiveness due to the reparative process about the point of injury has disappeared, the unruptured portion can take up the function of the muscle. These ruptures cause and are associated with sub-acromial bursitis; they are beneath the serous base of the bursa, which may or may not be torn through; if tearing occurs, a communication is established between the joint and the bursa. If at operating the bursa contains straw-coloured fluid, this communication may be found.

The SYMPTOMS are intense pain following some action in which the muscle is used, the arm falls useless, and something is felt to give

or snap. There is inability to abduct the arm; under the fibres of the deltoid, beneath the acromion, and over the joint, there is deep fluctuation, as if the whole bursa were full of fluid. There is inability to start abduction; but if the arm be passively abducted to about 140°, the patient can prevent the arm falling for an instant by a strong contraction of the deltoid, but the slightest downward pressure makes it drop to the side. External rotation was limited to about one-half the normal. These symptoms are like those of adherent sub-acromial bursitis. The tendon is reached by incision between the fibres of the deltoid, and the bursa is found beneath.

Tendon Suture.—Richardson[2] draws attention to some fundamental principles in the repair of tendons. Surrounding the entire tendon, running between the bundles of dense connective tissue (septa), and binding them together, is a layer of loose connective tissue, the peritendineum (*Fig.* 108). This peritendineum is much thicker than the tissue of the septa. It appears as a thin filmy sheath, and when picked up with the forceps closely resembles the connective tissue which binds muscle bundles together. The peritendineum and the septa stand in the same relation to the tendon as the periosteum and the endosteum stand to bone; in injuries of tendon, repair takes place from proliferation of the specialized tissue of the peritendineum and septa. The process of repair of a tendon that is simply cut without breaking the continuity of the tendon sheath is as follows: (1) Hæmorrhage occurs between the cut ends of the tendon, followed by inflammatory exudation. This exudate also infiltrates the surrounding tissue, including the tendon itself, for a considerable distance about the wound. (2) The exudate becomes organized; i.e., it is replaced by granulation tissue which arises by proliferation of the cells of the peritendineum and septa and the inner layers of the tendon sheath. This granulation tissue is at first indistinguishable from ordinary granulation tissue, but later it forms a dense and but slightly elastic connective tissue closely resembling normal tendon. (3) The mass of granulation tissue forms a fusiform mass larger in diameter than the tendon round the cut ends. The blood-vessels begin to disappear, and in small tendons, like those of the wrist, at the end of two weeks they are almost wanting. On this account gentle passive motion and massage should be begun at the end of fourteen days in small tendons. He recommends silk as the best suture. The method of suturing is:

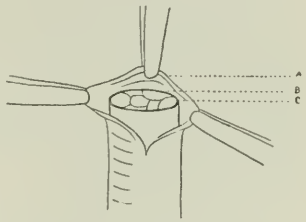

Fig. 108.—Tendon structure, (A, Tendon sheath held back with forceps; B, Peritendineum; C, Septa).

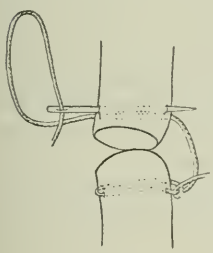

Fig. 109.
Tendon suturing.

(1) The first stitch is made in the shorter end of the tendon, $\frac{1}{4}$ inch from the cut end; (2) It is then carried back parallel to the first stitch at the same distance from the end of the tendon but a little to one side of the first stitch; a half knot is then tied, but not too tightly; (3) The same suture is made through the other end of the tendon, and while the assistant holds the two cut ends together and the suture is passed back parallel to the third stitch, a half knot is tied, and the two free ends of the suture are securely tied together. If the tendon is a large one, and if there is much strain in approximating the ends, a second or even a third similar suture may be introduced. As this suture tends to displace laterally the ends of the tendon, a through-and-through suture may be necessary to hold them in close approximation. Wherever possible the tendon sheath should be reconstructed about the tendon to prevent the ingrowth of scar tissue from surrounding connective tissue. The important things to bear in mind in tendon suture are (in order of importance): asepsis, preservation of peritendineum, approximation of ends, restoration of tendon sheath, and dryness of the wound.

Lever,[2] from a series of 13 experiments in cats on tendon regeneration, enumerates the following conclusions: (1) Silk or linen thread is an excellent material to use to lengthen tendons in suitable cases. (2) The growth of new tissue will penetrate and permeate the silk only slightly, in some cases not at all, and does not absorb it. (3) When the peritendineum and tendon sheath have been removed, some foreign body such as silk is essential for regeneration to serve as a director for the new growth. (4) With the sheath and peritendineum present and sutured, no foreign body need be inserted. In this case the new growth is true tendon tissue. (5) Without the sheath and peritendineum no true tendon tissue can be regenerated; such tissue is merely fibrous tissue, lacking elasticity and subject to stretching. (6) The new tendons are apt to be larger and stronger than the resected ones, especially when silk has been used to replace the resected portion. (7) If the sheath and peritendineum are preserved, and function is allowed early, adhesions may not occur. Without the sheath, adhesions occur much more frequently.

References.—[1]*Bost. Med. and Surg. Jour.* 1911, May 25; [2]*Ibid.* 1911, May 18.

TENOSYNOVITIS.

(*Vol.* 1910, *p.* 497)—Treatment by Passive Hyperæmia is often effective.

TESTICLE, UNDESCENDED. *Priestley Leech, M.D., F.R.C.S.*

Moschcowitz[1] recommends Bevan's as the best operation for this condition. Bevan states that the obstacle to descent of the testis is shortness of the spermatic vessels, and that division of these does not lead to gangrene of the testis so long as the artery to the vas is not divided. The incision is like that for the radical cure of inguinal hernia; the aponeurosis of the external oblique is split in the direction

of its fibres, and retraction of the lower flap exposes Poupart's ligament. The hernial sac is then isolated and freed from the spermatic cord. It is advisable to begin the isolation of the sac at the neck; the peritoneal cavity is closed by transfixion and ligation, or by circular suture. The distal part of the sac may be cut off close to the testis, at some distance from the testis, and a new tunica vaginalis formed; or it may be everted and sutured. In isolating the sac, great care must be taken in liberating the vas deferens; this should never be handled roughly, and should certainly never be pinched with forceps. It will now be seen whether the cord will permit transplantation. In some instances freeing the vessels of all extrinsic fascial structures by teasing and occasional snips with the scissors, will enable the testicle to be brought down. If this cannot be done, the spermatic vessels are divided and tied till the testis can be brought down into the scrotum; the neck of the scrotum being closed round the vas to prevent any displacement of the testicle. The radical operation for hernia is proceeded with, but without any transplantation of the vas.

REFERENCE.—[1]*Ann. Surg.* 1910, Dec.

TETANUS. *Purves Stewart, M.D., F.R.C.P.*

TREATMENT.—From time to time within the past ten or twelve years references have been made in current literature to cases of tetanus treated by Baccelli's method of hypodermic injections of **Carbolic acid** solution. Recently Baccelli[1] himself has published a *résumé* of statistical results by his own method of treatment. According to this distinguished Roman clinician, the mortality of untreated cases of tetanus is about 93 per cent. The discovery of the tetanus bacillus in 1890, and the subsequent manufacture of a tetanus antitoxin, promptly aroused hopes whose optimism has, unfortunately, not been justified by subsequent results. So much so, that Baccelli recalls the fact that during the Russo-Japanese campaign the medical officers who accompanied the Russian troops found the results of antitoxin treatment so disappointing in the field that they abandoned the serum treatment altogether. The initial observations which led Baccelli to employ carbolic acid in the treatment of tetanus were founded upon the remarkable sedative effect which this drug exercises upon the nervous system. He had already employed it in cases of neuralgia and myalgia with excellent results, and concluded that carbolic acid exercises an inhibitory, or at least strongly depressant, action upon the reflex excitability of the spinal cord. Moreover, it possesses also an antipyretic and an undoubted antitoxic effect upon cases of tetanus infection. This latter point was also proved experimentally by Tizzoni and Cantani, who found in 1890 that carbolic acid destroys the toxicity of the tetanus poison *in vitro*, and that a 5 per cent solution renders cultures of the tetanus bacillus sterile within thirty minutes *in vitro*.

In collecting his statistics, Baccelli states that he starts from a

fundamental postulate, which is that of sufficient dosage. One of the most striking points in his cases is the remarkable tolerance exhibited by patients to doses of carbolic solution. The ordinary single hypodermic dose was about 2 to 3 c.c. of a 5 per cent solution. This amount, however, was frequently exceeded, even in young patients, and for prolonged periods of administration. The urine was carefully watched throughout the treatment, but no case of carbolic acid poisoning seems to have been recorded. From the records of published cases, Baccelli has collected 190 upon which to base his statistical studies. These he divided into different categories—slight, moderate, severe, very severe, and fulminating. He then excluded all the slight and moderately severe cases, in which from the slowness of the invasion, and the long prodromal stage, with the slightness of the tetanic spasms, it was possible that recovery might have taken place spontaneously. He therefore confines himself to the severe, very severe, and fulminating cases, in which the ordinary mortality would be expected to reach 100 per cent. He recalls 94 cases of "severe" tetanus thus treated by carbolic acid injections with 92 recoveries, i.e., a reduction of mortality from 100 per cent to 2·12 per cent. Almost equally striking are his results in 38 cases of "very severe" tetanus. Of these, in 11 cases the remedy was administered in ridiculously small doses, and naturally without effect. Of the remaining 27 cases, 22 recovered, i.e., the mortality was reduced from 100 per cent to 18·5 per cent. His last category includes "fulminating" cases, in which death usually ensues within twenty-four or forty-eight hours. Fifteen of these are comprised in his series, and in all of them the amount of carbolic acid administered was entirely inadequate, less than 1 grm. per diem. Nevertheless, in one case Gallo was fortunate enough to rescue the patient by means of intrathecal administration of the remedy.

Altogether the gross mortality in 190 cases recorded by various physicians works out at 17·36 per cent. This in itself is a striking contrast to the accepted mortality of untreated cases, which has been shown to stand at from 80 to 93 per cent. Finally, to sum up, Baccelli claims that "severe" cases of tetanus, which would in all probability be invariably fatal, have under his treatment a percentage of cures amounting to 98 per cent, and the "very severe" cases a percentage of 81 to 85 per cent.

REFERENCE.—[1]*Berl. klin. Woch.* 1911, June 5.

TINEA VERSICOLOR. *E. Graham Little, M.D., F.R.C.P.*

McEwen[1] reports a very exceptional case of tinea versicolor, demonstrated as such by microscopic examination, on a man who had had the disease for twelve years, and showed, as well as the more usual macular eruption, a number of follicular papules resembling the lesions of pityriasis rubra pilaris; the fungus was freely present in those elevations, which could be removed with a curette.

The following applications[2] are useful in removing this eruption :—

R	Resorcini		Adipis Lanæ	
	Acid. Salicyl.	āā gr. xxx	Paraffini Mollis	
	Sulph. Præcip.	ʒij	Adipis Præparati	āā ʒvj

Misce. Fiat unguentum.

R	Resorcini	ʒij	Olei Lavandulæ	♏xx
	Olei Ricini	ʒiss	Spiritus Vini Rect.	ad ʒvj

Misce. Fiat lotio.

References.—[1]*Jour. Cutan. Dis.* 1911, 19; [2]*Pract.* 1911, 263.

TOBACCO POISONING. (*See* Narcomania.)

TONGUE, EPITHELIOMA OF. *Priestley Leech, M.D., F.R.C.S.*

Caird[1] reviews sixty cases of this disease. He thinks there is a relationship between antecedent irritation and malignant disease, and care of the teeth in later adult life is as necessary as in early youth. For some years he has performed excision of the tongue under local anæsthesia, removing the cervical glands some ten days later under general anæsthesia. Cocaine is used ; the tip of the tongue is infiltrated with a ·5 per cent solution to which adrenalin has been added. Two stout silk loops are then carried through the tongue on each side of the mid-line half an inch from the tip ; the tongue is pulled forwards, and its frenum, the mid-line, and the lateral and basal attachments are freely infiltrated with the solution. Within five minutes the operation of Whitehead may be performed with knife or scissors. The jaw may even be divided under local anæsthesia. He does not consider tracheotomy or laryngotomy necessary. The recurrences have been numerous, only 16 out of 60 surviving, and in 10 of these, the time since operation is only twelve months. Even in cases where the microscope did not reveal any trace of malignancy in the lymphatic glands, recurrence has taken place.

W. Sampson Handley, M.S., F.R.C.S.

Bashford[2] has shown that a minute lesion of the tongue not more than $\frac{1}{20}$ inch in diameter may exhibit all the features of a squamous-celled carcinoma, and that beneath plaques not more than $\frac{1}{4}$ inch in diameter extensive infiltration of the muscles and of the walls of the veins may be present. It follows that any local lesion of the tongue in an elderly person should be removed without delay unless cancer can be definitely excluded.

Reference.—[1]*Edin. Med. Jour.* 1911, Jan. ; [2]Report of I.C.R.F., 1910, *Lancet*, 1910, July 23.

TONGUE, HAIRY OR BLACK. *Robert Hutchison, M.D., F.R.C.P.*

This rare condition, of which less than a hundred cases have been published, is dealt with in a paper by Heidingsfeld,[1] in which he reviews the history and literature of the affection and describes some fresh cases. He concludes that cases of hairy tongue may be divided into two general classes : (1) True, idiopathic or genuine cases, characterized by well-defined, stable, black-brown, or yellow-brown, thick,

soft, fur-like patches covered with densely intertwined hair-like filaments, easily measuring from $\frac{1}{4}$ to $\frac{1}{2}$ inch in length; and (2) Spurious cases, distinguished by thickish, yellow-brown or greenish discolorations, of unstable evanescent character, covered with a soft mushy detritus, occasionally containing short filaments measuring $\frac{1}{8}$ to $\frac{1}{4}$ inch in length. The true cases owe their origin to some anomaly of development, probably of congenital nature, in the sense that the germinal products from which they are developed are present from birth, but do not undergo growth and developmental changes until early adolescence or some later period. Such an origin is assumed and very generally conceded for moles, vascular, pigmented papillomatous and unilateral nævi, cutaneous horns, etc., and can be extended with equal propriety to this affection, all the more since the histopathology reveals an anomaly of development rather than any evidence of an infectious or inflammatory nature. An anomalous development and congenital origin is further evidenced by the fact that the true, idiopathic, or genuine cases are of stable character, and remain unchanged in size and form for indefinite periods, and localized to definite areas. This would not be likely if they were of infectious origin or of inflammatory character resulting from local or general causes.

The spurious cases are unstable and evanescent, and probably owe their origin to such local or general irritating and infectious causes as tobacco, antiseptics, astringents, syphilis, etc. The presence of the filaments is probably due to an inflammatory hypertrophy of the papillæ filiformes. These cases in varying degree of intensity can be frequently noted, particularly in the early stages of syphilis, and constitute no uncommon affection. The diagnosis can be easily confirmed by removing some of the grumous coating of discoloured tongues by means of fine forceps, and floating it in clear water or alcohol. The hair-like filaments can then be readily seen with the naked eye. The majority of cases recorded in literature probably belong to this group. The writer could find no evidence in favour of a parasitic origin for the affection.

Reference.—[1]*Jour. Amer. Med. Assoc.* 1910, Dec. 17.

TONSILLITIS, EPIDEMIC. *E. W. Goodall, M.D.*

A rather severe epidemic of tonsillitis prevailed in North Salford and the neighbourhood from Oct., 1910, to April, 1911. The epidemic reached its height in January. Several papers dealing with the outbreak have been published, and a list of them will be found below. As the disease is not notifiable, it is impossible to state how many cases there were; but there must have been some hundreds. One practitioner alone (Grange), recorded over 250. Tattersall had definite information of 693 cases.

Symptoms.—The onset was sudden, with sore-throat and chilliness, and occasionally a well-marked rigor. In one case there was a severe initial convulsion (Grange). Backache and headache were usually present and often severe. Stiffness of the neck was not uncommon.

Later the cervical glands became enlarged and painful. The temperature was raised, often up to 102° F., and sometimes to a higher degree. There was much pain on swallowing. The tongue was furred and foul, and constipation the rule. Except in mild and uncomplicated cases convalescence was slow; the patient was left very weak and anæmic after the attack. The faucial lesion is described by Bruce Bell as being of three types: (1) Typical lacunar tonsillitis; (2) Acute suppurative tonsillitis or "quinsy"; (3) A general redness of the tonsils and fauces, with very marked œdema of the uvula. A rash seems to have been rare, but Grange states that there was a rash in a few cases, "not unlike scarlet-fever rash, but more punctate and patchy." This observer saw a "dusky petechial ecchymosis" in one case.

Complications appear to have been frequent. Those most often met with were arthritis, running the course of acute articular rheumatism; occasionally endocarditis, pleurisy, and pneumonia. Suppuration of the cervical glands, and cervical cellulitis with suppuration were also met with; also erysipelas, erythema nodosum, acute nephritis, and phlebitis in a few cases. Grange recorded three fatal cases, two in aged persons from toxæmia and heart failure, and one in an infant ten weeks old.

Etiology.—The disease attacked all ages and both sexes. Some difference of opinion is expressed as to its infectivity. On the whole, the evidence shows that it did spread from one person to another in families, and even from family to family. But it does not seem to have been markedly infectious; there were cases in which the patient fell ill of the disease after he had left the epidemic area, and no fresh cases arose in his vicinity.

Bacteriology.—The disease appears to have been due to *streptococci*. According to Tattersall, streptococci were invariably present in the swabs, sometimes alone, sometimes accompanied by *staphylococci*, *pneumococci*, *micrococcus catarrhalis*, *bacillus septus*, and *saccharomycetes*; in one case there were diphtheria bacilli. Carver states that the streptococcus was of the *conglomeratus* type. It was not ascertained why this streptococcal infection should have been so widely and severely prevalent. It was not due to infected milk, as have been some epidemics of tonsillitis, nor to sewer gas.

Treatment.—Bruce Bell found that locally lozenges containing **Formalin** and **Peroxide of Hydrogen** spray yielded the best results. In the early stage **Aspirin** and the **Salicylates** were useful; during convalescence **Strychnine and Iron.** In one case, in which there were general septicæmia, adenitis, and acute nephritis, this observer used a **Vaccine of Streptococci** prepared from a culture obtained from a suppurating gland in the neck. He injected 90 million cocci; in three days the temperature fell from 105° to normal, and the patient's condition, previously most unsatisfactory, improved; "indeed, the whole aspect of the case was changed."

References.—Grange, *Med. Chron.* 1911, 179; Bruce Bell, *Ibid.* 185; Rust, *Ibid.* 190; Tattersall, *Ibid.* 191; Carver, *Ibid.* 200.

TONSILS, DISEASES OF. *Geo. L. Richards, M.D., Fall River.*

Acute Tonsillitis.—It is good practice to take a smear and a culture in every patient who presents himself with a complaint of sore throat, where there is any sign of tonsillar infection. In not a few cases the smear will show diphtheria bacilli, and so a day or more is saved in giving the antitoxin. When a smear is taken from a membrane on the tonsil, and no diphtheria bacilli are found, the bacillus and spirillum of Vincent should be looked for before a diagnosis of acute tonsillitis is made.

Tonsillitis (*Figs.* 110, 111) is a local disease causing systemic infection, and the patient must primarily be treated locally. The first object is to destroy the invading organism as thoroughly as possible, and the remedy used should therefore be brought into contact with crypts opened in such a manner as to allow proper drainage. **Silver Nitrate** has been found to be specific in cases of acute tonsillitis when used in

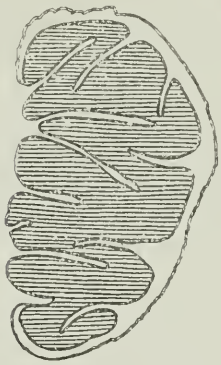

Fig. 110.—Normal tonsil in cross-section. Note the even calibre of the crypts.

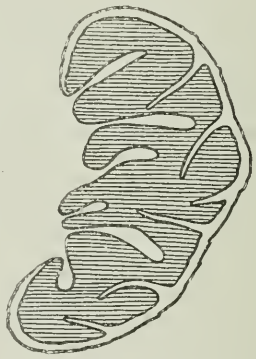

Fig. 111.—The infected tonsil in cross-section. The crypts are distended, being constricted at the neck.

a strength of 50 per cent. Hays[1] uses it as follows: After taking a smear and culture from the tonsil, the throat is thoroughly sprayed with some alkaline antiseptic to dissolve the mucus. Then it is again sprayed with cocaine (1 per cent), and adrenalin (1–5000), particularly over the tonsillar regions. Finally, the tonsils are swabbed with pure cocaine. After an interval of a few moments, the opening of each crypt is applicated with 50 per cent silver nitrate, the applicator resting in the crypt for ten to fifteen seconds. The patient is told to remain quiet for that day, to take a light diet and a cathartic, to spray the throat with a 50 per cent hydrogen peroxide solution, to suck cracked ice, and to apply iced cloths to the neck. As a rule the patient is well in twenty-four hours, but sometimes a second application is necessary. The applications are painless, and the effect from the silver nitrate is readily explained. This antiseptic is extremely powerful, and on inflamed tissue acts as an astringent. After applying the silver

nitrate one immediately sees an appreciable diminution in the size of the tonsil. The mouth of each infected crypt is disinfected, and what is more important, the shrinking process retracts the mucosa at the ostium, so that the deeper portions of the crypt are opened up. Some of the silver nitrate reaches these, and a sufficient passage remains patent to allow for drainage. No permanent injury has been known to result from this treatment, when it has been used in competent hands with proper illumination.

Peritonsillitis.—Levy[2] says that to incise too early is a disadvantage, as the cut must be made once or twice afterwards. In the beginning the process is phlegmonous, with many small abscess points. The amount of pus is very small at first, and it is better to wait until the various pus fossæ have become joined into one abscess. In only twenty out of sixty-one cases was one incision sufficient. In twenty-four cases the incision was of advantage, and in sixteen it failed entirely.

The incision should be made in the soft palate in the middle of the space between the uvula and the last molar tooth. The small scalpel is introduced near the lower border of the soft palate, and the cut made horizontally in an outward direction until the pus is freely emptied.

In cases where this condition frequently returns, something can be done to prevent it. Simple tonsillotomy does no good whatever, as the point of the infection in the supratonsillar fossa is not reached. All the tonsillar crypts should be cleaned out and their filling prevented. This can be brought about by extirpating the upper lobe of the tonsil. If this is done, the supratonsillar fossa is freely laid bare, and a lasting healing will take place. Total tonsillectomy, which is often recommended for this purpose, the author considers superfluous. [It is only by complete tonsillotomy that re-formation of the peritonsillar abscess can with certainty be prevented.—G. L. R.].

Tonsillar Tuberculosis.—While clinically, evidence of tuberculosis of the pharynx, with or without tonsillar inflammation, is among the rare manifestations of tuberculosis, pathological reports of various observers come as a decided shock. Wood's table gives 69 per cent of the tuberculosis cases examined, as suffering from tonsillar tuberculosis. For the purpose of comparing the frequency with which tuberculosis of the tonsil could be clinically diagnosed, with the reports of the laboratory findings, R. Levy[3] thoroughly reviewed his private records. In 450 cases of laryngeal tuberculosis, he found the pharynx and tonsils involved in 5·31 per cent, and the faucial tonsils alone in 1·77 per cent. Chiari's findings in 635 cases were 1·88 per cent. In order to reconcile this great discrepancy, a classification into clinical and latent tuberculosis has been made. Clinically one sees the tonsil but slightly, if at all, enlarged. It has a peculiar pallor, with a slightly œdematous or weeping surface, covered with a tenacious, thin, milky secretion. Situated beneath the surface of the mucous membrane are localized areas of pin-point white or greyish deposits. Later,

ulceration manifests itself by a superficial excavation, irregular in outline, unattended by inflammation. Later still, the ulcerations coalesce, giving the tonsil a mouse-eaten appearance. With an excess of disturbance, the œdema becomes greater, presenting definitely outlined, though not circumscribed, swelling. Subjective symptoms are discomfort in the throat, pain becoming excessive, and more or less marked constitutional symptoms.

The symptoms of latent tuberculosis are extremely vague, and the histological examination may also be open to question, as many of the findings attributed to tuberculosis occur in numerous other conditions. The question of latent tuberculosis is of special importance in children and in its relation to glandular involvement. The tonsil should not be considered tuberculous except in certain well-defined conditions, both clinically and histologically. The infrequency with which manifest tonsillar tuberculosis is found, except as a complication, makes extirpation rarely if ever indicated.

TREATMENT of latent tuberculosis of the tonsils consists in their **Removal** by the most complete method possible.

Neuralgia of the Tonsil.—Three groups of disturbances are now attributed to infected tonsils, viz., the tonsils themselves, the contiguous parts, and remote secondary infections. Todd[4] says that the structures contiguous to the tonsils may become involved in infective processes, and then by pressure upon the nerves in the locality give rise to certain definite symptoms. These symptoms vary from an uncomfortable feeling or slight soreness below the ear, to severe and recurrent neuralgia in the same or in more remote regions. When these neuralgic attacks occur as the result of inflammation of the nerves passing through this locality, a true neuritis may develop. Such would be the case when attacks of hoarseness or loss of voice take place. The function is disturbed because of involvement of the superior or recurrent laryngeal nerve.

In the diagnosis of such cases, the anterior pillar must be pushed back, and the tonsil lifted from its bed by means of a blunt tonsil hook. The exertion of traction, while causing no soreness or pain in the case of a healthy tonsil, will cause pain and flinching when it is diseased, or when the deeper structures are inflamed.

The point about such symptom complexes is that the patient, and his physician, do not attribute the trouble to the tonsil, which in many cases is overlooked as the etiological factor.

TREATMENT consists in the **Removal** of the diseased tonsils, even though there is no history of acute tonsillitis and no apparent enlargement. Relief is usually prompt.

Odynphagia in Tonsillar Disease.—Hald[5] has found that odynphagia occurring in connection with inflammatory disease of the tonsil and its surroundings can be relieved by what he calls the compression method. This is applied in two ways, by exercising firm pressure, first against the tragus, secondly against the upper part of the mastoid close to the insertion of the pinna. In most cases, tragus pressure is most

efficient. He has constructed an apparatus for this, as shown in *Fig.* 112. The efficiency of this method is due to the strong counter-irritation of a skin area whose sensory nerve-supply stands in intimate central relation to that of the diseased tonsil.

Tonsillectomy.—Hett,[6] from a series of anatomical studies, concludes that whenever the removal of the whole tonsil is required, it is obvious that the capsule must be removed entire, as it forms the boundary limit of the tonsil and is closely connected with it. The essential thing is the primary separation of the pillars; this being done, the capsule can be defined, readily separated and removed entire with the contained tonsil by any of the various methods in vogue. [Hitherto tonsillectomy has been principally advocated in America. The literature of the last year shows that an increasing number of British and Continental operators are adopting it.].

The extensive bibliography of Mackenzie[7] shows that tonsillectomy was performed by the ancients. Writing in the year 10 A.D., Celsus says, "Tonsils which remain indurated after inflammation, if covered by a thin membrane, should be loosened by working the finger around, and then torn out, but when this is not practicable they should be seized with a hook, and then excised with a scalpel."

Fig. 112.—Apparatus for making tragus compression.

Shurley[8] says that the two predominating factors influencing the question of conservative or radical procedure are, the latent doubt of a possible important function of the tonsil, and the belief that a complete removal is unnecessary. Physiology has not yet satisfactorily settled the function of the tonsil. The dangers and contraindications of the radical operation are dependent upon the experience, judgment, and ability of the individual operator. Tonsillectomy in one case of pernicious anæmia or acute leukæmia is sufficient to impress the surgeon with the value of blood examination in all suspected anæmias. One case of hæmophilia is sufficient to establish the value of a routine examination to determine the coagulation point. One death from chloroform is a life-long lesson in the value of ether.

Dangers and Contraindications.—These vary from three distinct points of view: those of clinic or dispensary, hospital, and private practice. There is less danger of hæmorrhage from tonsillotomy, with a tonsillotome or snare, than from a bungling or imperfect tonsillectomy. The average tonsillectomy is attended by much more pain than tonsillotomy. The dangers of tonsillectomy—hæmorrhage, shock, traumatism, and death from anæsthesia—diminish greatly with a careful, perfected surgical technique and equipment. Ether is the

only general anæsthetic advisable, although it is contraindicated in diseases of the lungs.

Indications.—McKenzie considers that enucleation of the tonsil is a clean, complete, and radical procedure, imperative in some types of tonsillar enlargement, advisable in others, and not contraindicated in any variety save and except for reasons which would also exclude the simple operation of tonsillotomy. In the case of professional singers, he would, however, be very cautious in recommending enucleation.

Beck[7] considers that whenever the tonsil requires surgical interference, with the rarest exception enucleation should be the procedure. He divides conditions which are beneficially influenced by the radical operation into three groups: those affecting the tonsil itself, those in close proximity, and systemic or general conditions.

Two pathological manifestations in connection with the tonsils are especially considered. In thirty-nine cases of enlarged glands of the neck, the results were as follows: Following enucleation, twenty-seven of the thirty-nine cases had no recurrence of the glandular trouble. Among the twelve remaining, there was some recurrence. In the rheumatic affections, cases which had resisted all local or general treatment were either cured or much improved when the tonsils were extirpated. Cardiac complications were noticeably influenced for the better.

Technique.—Guthrie[8] uses the Mackenzie or Heath tonsillotome, without the forks. Care should be taken to select an instrument with a ring slightly smaller than the tonsil to be removed. Local or general anæsthesia may be used. The tonsil is freed from the anterior pillar by a few touches of the scalpel. It is then firmly grasped with vulsellum forceps introduced through the ring of the guillotine, which is passed over the tonsil, and pressed firmly outward, the vulsellum in the operator's left hand pulling the tonsil forcibly inward, while the blade of the guillotine is drawn home. As division is effected, both the vulsellum and the shaft of the guillotine should be directed toward the tonsil from the opposite angle of the mouth. Care should be taken to remove the lower part. If these manipulations have been carried out carefully, it will be found that the tonsil has been removed in its capsule.

Gwinn[9] considers that in tonsillectomy the two essential points to be remembered are the anatomy of this special part of the throat, and the need for operating inside the tonsillar space.

Three arteries, tonsillar, ascending pharyngeal, and palatine, pierce the superior constrictor muscle, supplying the tonsil and pillars. It is important that the technique should be such as not to injure the muscles bounding the sinus tonsillaris. Hæmorrhage, the dread of tonsil surgery, will thus be avoided.

Barnes[10] finds that the amount of blood lost during a properly performed tonsillectomy is insignificant compared with the amount lost during the average tonsillotomy. In a series of 400 cases, but

one post-operative hæmorrhage occurred, and this followed the use of a tonsil punch.

Three places in the sinus tonsillaris are especially prone to bleed, the anterior and posterior pillar at the lower halves, and the base between the pillars. If no sharp cutting instruments are used at these danger points, the chances of hæmorrhage are greatly reduced.

His technique is as follows: The tonsil is pulled gently forward and inward, freed from anterior pillar by a sharp knife and blunt dissector, the knife being used to make an incision just outside the inner border of the plica, upward and backward to its junction with the posterior pillar. The blunt dissector is now introduced into the incision, and the upper and anterior part of the tonsil turned out of its bed. The posterior pillar is not touched. The tonsil is then cut off with a snare. Three to five minutes are taken to effect the separation. Three methods of controlling hæmorrhage are used: simple pressure, ligation, and suturing the faucial pillars.

Sluder[11] has described a novel method of tonsillectomy, which has for its essential and distinctive feature the fact that it moves the

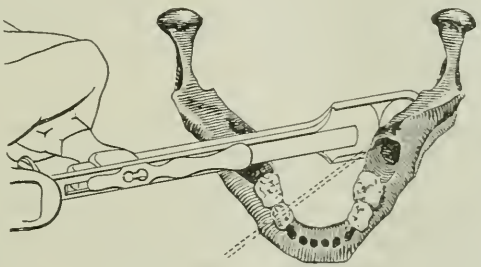

Fig. 113.—A young jaw, showing guillotine in position.

tonsil completely out of its normal bed in a forward and upward direction, and then utilizes one of the anatomic markings of the lower jaw as a vantage point in putting it through the aperture of the guillotine. This anatomic marking is a well-defined eminence just above the mylohyoid line, produced by the last molar tooth in its socket. It is found satisfactory under all usual conditions, provided the variations in the jaws of different ages are borne in mind. There is no need to grasp the tonsil with a vulsellum and pull it out. An imbedded tonsil is usually removed as quickly and easily as a protruding one. No loosening of the pillars is required, as a small bit of the anterior pillar is always removed with the tonsil. Stumps of tonsils left from previous operations are usually as easily removed as the original tonsils.

Results.—Lothrop[12] reviews sixty-one cases. Fifty-six, or 91 per cent, report decided improvement in breathing: obstruction in the remaining cases was due to other trouble. In 10 per cent there

had been injury to the pillars, but the voice had not been permanently affected.

The percentage of *post-operative hæmorrhages* was computed on the total number of cases (1,700) operated on during the past three years. In this number two cases bled so that it was necessary to suture the pillars of one side. In a third case the pillars of one side were sutured as a precaution. There were no fatalities. Therefore, the percentage of hæmorrhages that were of any consequence and required treatment was only ·00176.

Makuen[13] says that the sacrifice of one or more pillars of the palate and of the uvula seems not to give some operators any concern whatsoever, and the results upon the voice and speech have been in some cases not only disastrous, but altogether irreparable. The popular belief that the removal of tonsils is injurious to the voice is well founded, and it is due in large measure to careless or bad surgery.

For tonsillar patches the use of **Mercury Colloid** is recommended on *page* 25.

References.—[1]*Med. Rec.* 1911, May 13; [2]*Deut. med. Woch.* 1911, 1598; [3]*Jour. Amer. Med. Assoc.* 1910, Oct. 29; [4]*Ibid.* Aug. 27; [5]*Med. Rec.* 1911, Feb. 25; [6]*Brit. Med. Jour.* 1910, Nov. 19; [7]*Jour. Amer. Med. Assoc.* 1910, Oct. 29; [8]*Hosp.* 1910, Dec. 3; [9]*Jour. Amer. Med. Assoc.* 1911, Jan. 21; [10]*Bost. Med. and Surg. Jour.* 1911, Jan. 26; [11]*Jour. Amer. Med. Assoc.* 1911, Mar. 25; [12]*Bost. Med. and Surg. Jour.* 1911, ii, 173; [13]*N.Y. Med. Jour.* 1911, ii, 265.

TRYPANOSOMIASIS. *Leonard Rogers, M.D., F.R.C.P.*

David Bruce, A. E. Hamerton, H. R. Bateman, and F. P. Mackie[1] have published a series of papers on their investigations of *sleeping sickness*, for the Royal Society. They first deal with their work in confirming and extending the important observations of Kleine on the development of trypanosomes in tsetse flies, allowing of their carrying the infection many days after biting an infected animal. Bruce and his fellow-workers have carried out an extensive series of experiments which prove that both the ordinary wild tsetse fly and clean flies obtained by hatching from the pupæ, when fed on an animal infected with sleeping sickness become themselves infected with the *Trypanosoma gambiense*, and can, by their bites, convey the disease to healthy animals. The shortest time before the flies became infective was 18 days, and the longest 45 days, the average being 32 days. No fewer than 1840 caught flies were used in the experiments, but less than 1 per cent became infective. Laboratory-bred flies gave results very similar to those of the wild ones, the date of infection averaging 36 days in eight positive experiments. The injection of emulsions of the flies sometimes produced infection, although the microscope had failed to reveal trypanosomes in them, showing that the injection is a more reliable test than the microscope. They also record experiments showing that certain animal trypanosomes, namely *T. dimorphon*, *T. vivax*, and *T. nanum* may also develop in *Glossina palpalis*.

In a further paper[2] the same authors record experiments to test

whether cattle may act as a reservoir of the sleeping-sickness trypanosome. The fact that the shores of the Victoria Nyanza have remained infective for some two years since the inhabitants were all removed, makes a search for some such manner of infection imperative. Two experiments with cattle showed that these may be infected with sleeping sickness by the bites of previously infected *G. palpalis*, and that their blood is then capable of conveying the infection to healthy animals. Moreover, they found that this tsetse fly, caught in a wild state on the shores of the lake, was also capable of infecting cattle, and that flies could then in turn be infected from these cattle, and convey the disease to healthy monkeys. Lastly, one out of 17 cattle from the various sources was found to have been naturally infected with sleeping sickness. Cattle may therefore form reservoirs of infection of sleeping sickness in fly areas.

Next,[3] these workers examined wild antelopes in the light of possible reservoirs of the disease, these animals being present in large numbers on the lake shores. They proved that antelopes can be readily infected with sleeping sickness, and flies fed on them can then convey the disease to healthy monkeys; but none of the few animals they were able to examine was found to have been naturally infected. They form, therefore, a potential reservoir. On the other hand,[4] the domestic fowl of Uganda could not be infected with sleeping sickness, so they cannot act as a reservoir of infection. The same authors also record[5] a note on trypanosome diseases of domestic animals, having found two cattle infected with an organism differing in its animal reactions from that of sleeping sickness.

L. E. A. Beven[6] has studied the animal reactions of a strain of human trypanosome obtained from a patient from northern Rhodesia, and Alexander Brown[7] records two cases of sleeping sickness in natives of the same region. Arthur G. Bagshawe[8] has contributed a paper on recent advances in our knowledge of sleeping sickness. He points out the seriousness of the discovery of cases of the disease in northern Rhodesia and Nyassaland, which are practically certainly outside the limits of the distribution of the *Glossina palpalis*, so that some other species of tsetse fly appears to be able to convey the infection. Since Kleine, confirmed by Bruce, showed that tsetse flies could after a long latent interval become permanently infected with pathogenic trypanosomes, evidence has accumulated to show that direct immediate transmission of the infection by flies is much rarer than was formerly thought, some of the earlier positive results having been vitiated by the fact that the same flies were used repeatedly, and some of them might have become permanently infected. Epidemics of the disease are only likely to be produced by flies which can become permanently infected. It appears that not more than 2·5 per 1000 of the flies are infected in natural conditions. For diagnostic purposes it is important to examine the blood as well as to do gland punctures, as the former may give positive results when the latter give negative.

Treatment.—No important advances have been made, little being now heard of the various arsenical preparations from which much was at first hoped. Evidence that recovery does occasionally take place in natives as well as in Europeans has, however, been accumulating. F. W. Mott[9] records the absence of microscopic lesions in the brain of a patient who had recovered from sleeping sickness. Scherschmidt[10] reports on a trial of **Arsenophenylglycin** in 33 cases of sleeping sickness, but the hopes derived from its success in animals were not confirmed by its use in man in doses which are safe. It was especially ineffective in cases previously treated with atoxyl. H. G. Plimmer, W. B. Fry, and H. S. Ranken[11] record some negative results in the treatment of surra, a trypanosome infection of horses, with **Antimony** compounds.

C. N. B. Camac[12] reports on the injection of metallic antimony in Lambkin's oily medium. Intramuscular injection proved too painful to be repeated. Subsequently one-sixth of a grain of **Antimony Sodio Tartrate** was injected intravenously. Sudden attacks of nausea and great weakness occurred, but the febrile paroxysms rapidly decreased, and the patient has now been free from parasites and fever for eighteen months.

R. Ross and D. Thomson[13] record a case of sleeping sickness in which daily counts of the trypanosomes were made by the thick film process of the former, together with leucocyte counts. A remarkably regular series of rises and falls in the number of parasites at intervals of seven or eight days was thus revealed, followed by rises in the number of leucocytes, and especially of the mononuclear forms. The increase in the parasites also coincided with some rise in the temperature curve. Various forms of treatment were tried. Atoxyl in relatively small doses seriously affected the eyes, while it produced no obvious decrease in the parasites. A "vaccine" treatment was tried by injecting rats' blood containing very large numbers of the parasites, but they only produced an increase in the parasites in the patient's blood, apparently by stimulating the division of the trypanosomes which always takes place during the periodical increases in their numbers. Injections of leucocytic extract produced marked increase of the white corpuscles of the patient; temporary improvement followed one of the injections, but pneumonia soon after caused a fatal termination. The same writers[14] report on the effects of treatment on the parasite curve in animals. They found that small doses of atoxyl prolonged the life of the animal without killing many of the parasites. Large doses kill the parasites but do not cure the animal, apparently owing to the survival of atoxyl-resisting forms in the internal organs. The vaccine treatment described above also proved unsuccessful, as did injections of leucocyte extract and *x*-rays. On the other hand, the use of a **Cold Chamber** at between 20° and 38° F. prolonged both the incubation period and the course of the disease in animals; so they suggest a **Winter in Switzerland or Canada** in the treatment of sleeping sickness.

References.—[1]*Jour. R.A.M.C.* 1910, 422; [2]*Ibid.* 1910, 653; [3]*Jour. Trop*

Med. and Hyg. 1911, 65; [4]*Ibid.* 1911, 97; [5]*Ibid.* 1911, 33; [6]*Ibid.* 1911, 19; [7]*Ibid.* 1911, June 1; [8]*Ibid.* 1910, 343; [9]*Lancet*, 1911, Feb. 25; [10]*Deut. med. Woch.* 1911, Feb. 16; [11]*Jour. R.A.M.C.* 1911, 386; [12]*Amer. Jour. Med. Sc.* 1911, ii, 218; [13]*Ann. Trop. Med.* iv, 261, 395; [14]*Ibid.* 487.

TUBERCULOSIS OF BRONCHIAL GLANDS.

J. J. Perkins, M.B., F.R.C.P.

The growing recognition of the frequency and importance of this condition in young children is leading to a careful review of the evidence on which the diagnosis can be made. Coombs[1] has investigated the value of the *venous murmur* described by Eustace Smith as a sign of this condition. Investigating 100 children of fifteen years or under, without respect to the nature of their disease, he found it present in 51 per cent. In children over sixteen years, examination showed that it was unusual to find any such murmur. It is not especially associated, he shows, with tuberculous adenitis within the thorax, as not only has he found it in various diseased conditions, but also in absolutely normal children. He infers that the bruit is certainly venous, and in many cases without doubt is produced at some point in the internal jugular veins without the thorax, for it is heard in the neck even more clearly than over the chest wall. Its augmentation by postures which stretch the jugular veins must be due, as Sawyer also concludes, to flattening of their lumen by pressure against the transverse processes of the lower cervical vertebræ.

The symptoms and physical signs of the condition under review have been collected by Stoll.[2] The onset is usually insidious, and the symptoms are the familiar ones of loss of appetite, languor, and irregular fever; thoracic pain is often present, and expiratory stridor sets in resembling the expiration of asthma, but more often constant than paroxysmal; it is rarely present after the fourth year. In advanced cases the breathing may become so laboured as to be mistaken for croup, and a quite characteristic cough almost exactly resembling that of pertussis is often present.

Turning to physical examination, dilated veins are often to be seen on the anterior aspect of the thorax, and slight puffiness of the face and eyelids may be present. Spinal tenderness on firm palpation, first described by Petruschky, chiefly present over the upper thoracic spines, is a valuable sign. Percussion over the manubrium sterni has little diagnostic value, as up to the sixth year the thymus gives a dull note; spinal percussion, however, gives information of great value. A dull note is obtained normally over the upper four thoracic vertebræ, while over the remaining dorsal spines the note is a combined osteal and pulmonary one. Dullness over the fifth or sixth dorsal spine is pathological and indicative of a mediastinal tumour.

A few years ago d'Espine[3] called attention to the fact that enlargement of these glands gave distinctive *auscultatory* signs. Normally the tracheal quality of the breath sounds ceases at the seventh cervical vertebra, but when the bronchial glands are enlarged, the tracheal qualities are continued with diminished intensity downward over the

thoracic spine for a variable distance. Under this condition distinct bronchophony is also heard, and the voice accompanied by an added whispering sound usually localized to the first two dorsal vertebræ, but possibly extending to the fourth or fifth.

The diagnosis can be confirmed by the *x*-rays, and a simple enlargement of glands such as follows measles, whooping-cough, and influenza may be distinguished from tuberculosis by von Pirquet's reaction.

Treatment by **Tuberculin** should be very efficacious.

References.—[1]*Brit. Jour. Child. Dis.* 1911, Mar.; [2]*Amer. Jour. Med. Sci.* 1911, Jan.; [3]*Brit. Med. Jour.* 1909, Oct. 15.

TUBERCULOSIS OF EAR. (*See* Ear, Diseases of.)

TUBERCULOSIS, INTESTINAL.

Glutannin useful in (*page* 16); **Protargol** (*page* 36).

TUBERCULOSIS OF LARYNX. (*See* Larynx.)

TUBERCULOSIS OF NOSE AND PHARYNX. (*See* Nose, Diseases of.)

TUBERCULOSIS, PULMONARY. *J. J. Perkins, M.B., F.R.C.P.*

Specific Diagnosis.—Inman,[1] reviewing the results of *sputum examination*, insists that the specimens chosen should be from the first sputum coughed up after the night's sleep. Styles,[2] working in the Brompton laboratory, has tested Spengler's methods, and found that his 'pikrin' method undoubtedly shows in a large number of cases a greater number of bacilli than are rendered visible by the Ziehl-Neelssen method; but apparently in only one case in fifty, and that a doubtful one, was a positive diagnosis reached by this method after the Ziehl-Neelssen method had failed. He concludes, therefore, that for all ordinary purposes the last named is sufficient, and would reserve the pikrin method for confirmation in special cases. In the pikrin method, after staining with carbol-fuchsin, picric acid alcohol is added for from 2 to 3 seconds; the specimen is washed with 60 per cent alcohol, treated with 3 to 4 drops of 15 per cent nitric acid, washed again with 60 per cent alcohol, and stained with picric acid alcohol until the film is yellow. Styles cannot confirm Spengler's views as to the discrimination between tubercle bacilli and 'perlsucht' bacilli in sputum films, and in this he is at one with the British Royal Commission and the German Commission on Tuberculosis.

If the Ziehl-Neelssen method proves negative, Inman prefers to rely on the *antiformin* method, in which the sputum is homogenized with 15 per cent antiformin (a mixture of equal parts of sodium hypochlorite and sodium hydrate), the mixture sedimented in a centrifuge, the deposit washed in normal saline solution and again centrifuged. Films are made from the resulting deposit, fixed in perchloride of mercury, and stained by the Ziehl-Neelssen method. In his own words, it needs but a short acquaintance to be convinced of the superiority of this method over others.

Tubercle Bacilli in the Blood.—Various observers have tested Rosenberger's discovery (discussed in last year's *Annual*) that tubercle bacilli can be found in the blood-stream of the majority of consumptive patients even in the earliest stages of the disease, but have not on the whole been able to confirm his work, at least as regards early cases. Jessen and Rabinowitsch, for example, found bacilli in the blood in five out of twelve third-stage cases, in none out of twelve second-stage cases, and in two out of twelve first-stage cases.

Tubercle Bacilli in the Fæces.—According to Inman,[1] the antiformin method is specially suited to these examinations, which it has been claimed give positive results in many cases in which sputum is absent. An emulsion is made to which 20 c.c. of antiformin are added: after standing for two hours, some of the sediment is removed with a pipette, films are made, fixed with perchloride of mercury, and stained by the Ziehl-Neelssen method. Inman finds the method a reliable one. In twenty-six cases, bacilli were found in the sputum in two instances when they were absent from the fæces, and in one case in the fæces when they were absent from the sputum, the remaining results being identical. Inman advises the method for investigation in the case of children, who commonly swallow their sputa.

Von Pirquet's Cutaneous Reaction.—Inman concludes that this result, while of value and eminently specific in the case of young children, can only show the presence of latent tuberculosis in adults, for 70 per cent of the apparently healthy give a positive reaction. According to von Pirquet's own figures, 13 per cent of apparently healthy children as early as the age of two to four years give a positive reaction, while at the age of six to ten the figures have risen to 35 per cent.

Discussing the *subcutaneous tuberculin test of Koch*, Inman finds that not even the febrile reaction is to be taken as specific, the generally accepted view being that fever is no criterion for distinguishing active from inactive tuberculosis, and that it merely shows that the inoculated individual is a bearer of tuberculosis.

As regards *the opsonic index*, a positive result is of value, and the more so the further removed from the normal (0·8 to 1·2), but the method is open to the objection that it may require a considerable degree of exercise when this is difficult to give, and that even in a swinging index the examination may coincide with a moment when the figures lie within the bounds of the normal.

Taken on the whole, it is evident that in doubtful cases all methods of examination must be carefully compared with the clinical evidence and diagnosis.

Emery[3] during the year, has pursued the search for a method of *serum diagnosis* for tubercle comparable with the Wassermann reaction for syphilis, i.e., based on the fixation of complement. He has perfected a method which he believes to be of great value though not an absolute one; indeed, he goes so far as to say that an absolute method for the serum diagnosis of tuberculosis will never be invented, as normal

persons all contain some amount of antibodies to the tubercle bacilli. He insists (as does Nesfield[4]) on the importance of using an emulsion of bacilli and not tuberculin as the antigen, but he further attaches the greatest importance to the accurate standardization of the emulsion. He takes as his criterion for the strength of the reaction, the time necessary for the complete absorption of all complement when the serum and emulsion are mixed in a certain proportion (1 to 4). In health the absorption time is about fifteen to twenty-five minutes, while in tuberculous patients the time is as a rule greatly shortened.

Treatment.—Deal[5] reports excellent results, based on a study of seventeen cases, from **Tuberculin** treatment in advanced stages of tuberculosis, the tuberculin used being Gabrilowitsch's tuberculinum purum, a modification of Koch's "old" tuberculin, in which an endeavour has been made to eliminate the albumose constituents, which have no therapeutic value, and cause the untoward reactions.

More than one method has been employed to remove the albumoses, which are the product of the action of the bacilli on the media on which they are grown. Gabrilowitsch sought to remove them by means of chemical reagents (alcohol, chloroform, xylol), whereas Jochmann[6] and Moeller worked with an albumin-free culture fluid. They report excellent results from the use of their albumose-free tuberculin, and affirm that Gabrilowitsch, in his effort to exclude the albumoses by chemical reagents, has so modified tuberculin that it is practically inoperative. However this may be, Deal certainly seems, in his careful study, to have seen good results from tuberculinum purum. The cases treated were all in an advanced stage of tuberculosis, and yet he can say that he has never seen any unpleasant effects follow its use, and especially none of the severe reactions which are common with the use of old tuberculin; fever was reduced, weight improved, and the number of tubercle bacilli in the sputa lessened. In one patient, after a second injection, the temperature dropped from 102° to 99°; in another case the temperature gradually and steadily fell from 102° to normal; in a laryngeal case the loss of weight was completely checked, and in two cases of tuberculous arthritis marked benefit was seen. Deal found no difficulty in carrying out the scale of injections recommended by Gabrilowitsch, 16 in all, the dose being gradually raised from 0·02 mgram to 100 mgrams.

Kramer[7] calls attention to the frequency with which *angina of the throat* takes place in the course of treatment by tuberculin, at any rate in ophthalmic cases. In seventy cases angina occurred sixteen times, i.e., 22·8 per cent. He thinks that insufficient attention has been drawn to this symptom in tuberculin treatment; in no case was the affection of any serious import, but this liability of the tonsils to inflammation, apart from other tissues and organs, raises a difficulty as to its cause which he does not consider is adequately explained on the hypothesis that the tonsils so often contain foci of tubercle.

The treatment of phthisis by **Artificial Pneumothorax,** in spite of the fact that in 1910 more than 400 cases of this mode of treatment

had already been published in foreign literature, remains almost unknown in this country. It has long been known that the advent of a pleural effusion has a very beneficial effect in checking the advance of tuberculosis in the lung, and in consequence it has been considered good practice not to remove an effusion unless it seriously interfered with the patient's respiratory powers. This point has been well insisted upon by Sir James Fowler in his book. Consideration of the point led to the conclusion that the production of collapse of the lung by means of an artificial pneumothorax might have a similar beneficial effect.

The *method* usually employed is to pass a fine hollow needle through an intercostal space and inject nitrogen, this gas being chosen because of its slower rate of absorption. The point commonly chosen for the puncture is the 7th or 8th intercostal space in the axillary line, the object in choosing a spot so low down being to reach the pleura where it is free from adhesions. The usual antiseptic precautions are of course taken, and a local anæsthetic is advisable. If the point of the needle lies between the surfaces of non-adherent pleura, the manometer with which it is connected will show characteristic negative respiratory oscillations, a typical reading being – 14 cm. water on inspiration and – 6 cm. on expiration. When the characteristic oscillations are obtained, nitrogen not exceeding 200 to 300 c.c. is introduced for the first injection and the needle withdrawn. The injections are repeated daily or every other day, until the lung is collapsed and a positive intrapleural pressure obtained.

The *danger* of injecting the gas into a vein can be avoided by fitting a syringe on the needle and aspirating to see if blood is drawn. Several deaths from nitrogen embolism have been reported, and some such precaution is therefore necessary. Pleural reflex also has led to death, though only in very rare instances; but the operator should always be on his guard and ready to withdraw the needle at the first sign of this condition. To avoid the danger, Forlanini has advocated anæsthesia of the pleura by stovaine before injection.

The *benefits* of the treatment will depend largely on the degree or extent of the pleural adhesions which exist over the diseased lung. These adhesions may be so widespread and uniform that they may make the production of a pneumothorax impossible; while on the other hand the best results are seen, and complete collapse of the lung obtained, where no adhesions exist. Even in spite of the presence of some adhesions, however, good results are obtained, the partial limitation of the lung's mobility appearing sufficient to arrest the disease. The effects on the lung vary; although in the majority of cases the compressed lung will re-expand, in other instances, although the compression may have lasted for two months only, the lung is converted into a mass of scar tissue.

A *serous effusion* into the pneumothorax follows in about one-third of all reported cases, and if of large extent, may have to be tapped and some of the fluid replaced by nitrogen.

Surgical emphysema, superficial or deep, is another complication, best met by firm strapping or bandaging over a pad.

The nitrogen in the pneumothorax will have to be renewed from time to time. In one recorded case the following series of injections were made: Aug. 11th, 1910, 300 c.c., Aug. 13th, 450 c.c., Aug. 15th, 200 c.c., Aug. 17th, 400 c.c., Aug. 19th, 175 c.c., Aug. 22nd, 600 c.c., Aug. 30th, 320 c.c., Sept. 4th, 300 c.c., Sept. 7th, 500 c.c., Sept. 12th, 600 c.c., the positive intrapleural pressure being gradually raised from 4 cm. of water to 14. Between Sept. 20th and March 6th, 1911, eighteen further injections were given and the pressure gradually raised to 32 cm.

As to the *length of time* during which the pneumothorax must be maintained, no definite answer can be given, but in several recorded cases eight months proved insufficient; fortunately, Lillingston[8] says, the pneumothorax can be maintained by refilling every month or two, and the patient is not incapacitated from light work.

The *indications* for treatment (Pearson[9]) are that one lung must be either free from disease or give very few signs; otherwise the production of the pneumothorax is unlikely to lengthen life or alleviate symptoms; but some advanced cases, apparently hopeless under ordinary treatment, have recovered by this means. Lucius Spengler[10] has published the results of fifteen cases in which a pneumothorax had been present for at least nine months. Of these the pneumothorax was complete in nine and almost complete in six, while in seven exudation followed. The time from the first to the last injection in these cases was in one case 2 months, in six 7½ to 10 months, in three 10 to 16 months, in four 18 to 24 months. Only those cases were reported in which after treatment there was no fever, cough, or expectoration, or if any, free from tubercle bacilli. All were capable of work, whereas the prognosis before operation was in the case of twelve unfavourable and in three bad.

The production of an artificial pneumotharax can be applied also, as suggested long ago by Cayley, for the control of *hæmoptysis*. Lillingston[10] gives the details of two cases from Norwegian sources which were successfully treated in this way. In the first case the hæmorrhage was so violent that the patient was reduced in ten minutes to a state of profound anæmia and collapse. The skin was rapidly disinfected with tincture of iodine and the needle thrust into the chest as the hæmoptysis continued. 500 c.c. of nitrogen were injected, and as the intrapleural pressure remained negative a further 200 c.c. were admitted. The cough and hæmorrhage ceased at once. On the following day about half an ounce of blood was coughed up, but the injection of 500 c.c. of nitrogen at once checked the bleeding. No further hæmorrhage occurred, and the patient made a good recovery. In the second case the hæmoptysis had already lasted for six days when the patient was admitted to hospital, and during the following fortnight over a litre of pure blood was brought up. The patient became very anæmic, and the pulse was rapid and feeble. Both lungs

were affected, but it was assumed that the blood came from the left, as the disease was more extensive on that side. Puncture was attempted in the sixth space between the middle and anterior axillary lines, but no free space being found here, a second attempt in the seventh space was successfully made and 200 c.c. of nitrogen were injected. The hæmorrhage ceased at once, and, the injections being continued, did not recur. The great drawback to the treatment is the uncertainty as to which lung is the seat of the bleeding. In the above case the lung which was the seat of the more extensive disease was chosen, rightly as the result proved. It by no means follows, however, that this would always hold good, and as a matter of fact the writer has seen several fatal cases in which the bleeding came from the less diseased lung. To throw extra work on a lung the seat of a leaking pulmonary aneurysm would be disastrous, and hence this method must always remain a final resort in desperate cases only.

The treatment of pulmonary tuberculosis by **Antiseptic Inhalations,** the merits of which have been recently advocated by D. B. Lees, is really, as Burney Yeo[11] shows, but one more example of an older method of treatment whose merits have been allowed to fall out of sight. As far back as 1876 Yeo himself called attention to the value of such inhalations, and in this he was supported by such men, among others, as Wilson Fox, Dreschfeld, A. E. Sansom, and Sir William Roberts, all of whom have borne witness to the remarkably beneficial results which follow its use. These results are summarized by Lees[12] in the words that cough and sputum are quickly diminished, temperature soon falls to normal, there is a rapid gain in weight, the dull area is lessened, and tubercle bacilli are less easily found, while ultimately they gradually disappear altogether. It is evident that the method is of a special value in the relief of distressing cough. Yeo himself and Garry[13] unite in pointing out that to be of benefit, these inhalations must be practically continuous by night as well as by day, the only intervals allowed being during meals, the respirator being worn for not less than twenty-two hours in the twenty-four.

Garry himself is an evidence of the efficacy of the method: twelve years ago he was found to be suffering from pulmonary tuberculosis, which residence abroad and faithful treatment failed to check. On his return to England, his condition, in his own words, was worse in every respect; he then determined on his own initiative to inhale a combination of **Creosote, Carbolic Acid,** and **Tincture of Iodine** (10 drops every two hours on a Yeo's inhaler). For the first fortnight the inhalations were almost continuous throughout the twenty-four hours. At the end of the first week there was a marked improvement in all the symptoms, while by the end of the fifth week the cough had subsided, the expectoration had ceased, and the temperature, which had always been over 101° in the evening, had fallen to normal.

Dundas Grant[14] finds the method very advantageous in laryngeal cases, his formula being :—

R	Creosoti	℥cxx	Menthol	gr. x
	Spt. Chloroform.		Ol. Cinnam.	℥v
	Ol. Pini. Sylvest.	āā ℥xc		

while for those who dislike the flavour of cinnamon, oil of citronella may be substituted. Patients under this treatment should be rigorously confined to bed for the first fortnight, and for as much longer as may be necessary until the temperature becomes normal. Movement and graduated exercise are then allowed, the inhalation, however, being continued for several hours, e.g., six daily. An abundant diet is of course enjoined at the same time.

Of the thirty cases reported by Lees[15] last year, he considered twenty-two as certainly cured, i.e., the cure had stood the test of time, as they had remained in active work for a year. Eight other cases were apparently quite well, but had not stood the test of time ; five he looked upon as nearly cured, while in three only was he in doubt as to the favourable issue. Twelve of the fourteen still remain well and in constant active work ; as to the other two, he is without information ; seven of the eight whom he classed as apparently quite well have remained well and in active work. One had a slight relapse, but has since been able to return to work, while the three doubtful cases have made satisfactory recoveries.

Beggs[16] and Peters[17] have investigated the value of **Mercury** in the treatment of tuberculosis, and find themselves quite unable to confirm the results which are claimed for it by Barton Wright. Indeed, Peters goes so far as to attribute to a specific taint any good results that have followed from it in the treatment of tuberculosis. His work covered a series of twenty-three patients, of whom four only were improved and six cured ; of the six, he classes four as syphilitic ; the other two he describes as excellent cases with little pulmonary involvement, who would have done well on any system. Beggs comes to the conclusion, based on the observation of forty-four patients, that while mercury is in no sense a specific in pulmonary tuberculosis, it is of value in certain cases. What those cases are he has not been able to determine, with the exception of those definitely complicated with syphilis, but his impression is that they are cases in which a luetic taint cannot be excluded with a reasonable degree of certainty. In no instance has he noticed the remarkable resolution of physical signs described by Wright.

The use of **Raw Meat Juice** in the treatment of consumption (zomotherapy) introduced by Richet and Héricourt,[18] is no mere dietary fad, but stands on a sound basis of experimental fact. The difficulty in carrying it out is that a minimum of half a pound of raw meat a day must be taken, to obviate which further researches were undertaken by the discoverers, showing the specific elements to be contained exclusively in the muscle juice. The solid components of meat have no therapeutical action. Tuberculized animals fed on meat from

which the muscle plasma had been expressed, died in approximately the same time as the control animals, whereas the expressed juice prevented infection with tuberculosis in animals, and when given to those already infected, checked emaciation and restored them to health, while the control animals died. This result is not due to hyper-alimentation, since by far the greater part of the nutritive principles remains in the meat from which the juice has been expressed. Cooking destroys the organic principles, whatever they are, to which the action of raw meat is due ; and therefore the various products, meat extracts, etc., which are prepared from cooked meat, however valuable they may be as foods, have none of the therapeutic properties inherent in raw meat juice. It is important to note that not only does cooking destroy these vitalizing properties, but that the juice must be expressed as soon as possible after the animal has been slaughtered, two or three hours in summer, and four hours in winter. The juice, moreover, is eminently unstable, and develops toxic properties within an hour, so that Héricourt advises its being collected in a vessel surrounded by ice and consumed as soon as possible: a troublesome process, but one well worth while. The field for the use of raw meat juice is not confined to tuberculosis, but extends to the various forms of anæmia, rickets, neurasthenia, and convalescence from the great fevers, such as typhoid, and after hæmorrhage. The amount to be taken daily to be efficacious is the quantity which can be expressed from 300 grams of beef for mild cases and 500 grams and upwards for severe cases. Smaller quantities are no doubt beneficial, but cannot be relied on. Héricourt thinks the inconclusive results reported here and there are due to the neglect of this principle, though he says that one does meet with a few cases, usually those associated with secondary infections, which prove refractory.

Leonard Robinson[19] describes the effects of treatment by **Radio-active Iodine** and **Menthol,** first introduced by Prof. Szendeffy, who brought forward facts tending to show that it was possible to arrest *in vitro* the development of tubercle bacilli by this means, and also to stop the progress of the disease in animals which had been inoculated experimentally. Bernheim has claimed that under the influence of this treatment bacilli disappear from the expectoration, and that there is a great general improvement. Its good effects are not confined to tubercle bacilli, but also reach the group of the streptococci, which were rapidly destroyed in two cases of severe sore throat. The formula employed is :—

℞	Peptonized Iodine	0·75 gr.	Radium-barium Chloride	
	Menthol	0·06 gr.	(Ether solution)	gtt. $\frac{1}{10}$

A series of 40 injections is given, each of 1 c.c., intramuscularly in the gluteal region.

McElroy[20] reports a most interesting case of good effects from the intravenous injection of **Chinosol and Formaldehyde** by means of Maguire's apparatus. Very striking benefits evidently followed this

mode of treatment, and tubercle bacilli, which had been very numerous, completely disappeared. Thirty-three injections were administered in all, on consecutive days, each consisting of 50 c.c. of a 1–2000 solution of formaldehyde plus 1–4000 solution of chinosol, the median basilic or median cephalic veins being chosen as the site; no unpleasant local results followed. Napier[21] was so much struck with the effects of this treatment in McElroy's hands, that he has introduced it into the phthisis ward at the Royal Victoria Infirmary at Glasgow, and considers the effects as promising. Prominent superficial veins are requisite for the treatment, and the two germicides, being active irritants, must be introduced in very dilute solution.

Tuberculosis and Menstruation.—Macht[22] discusses the whole relationship and bearings of these conditions. He points out first of all that not only is amenorrhœa a symptom of tuberculosis, but that in tuberculous girls the menses may be very much delayed in appearance at puberty. This is of course well known, but the frequency of menorrhagia as an early sign of tuberculosis has hitherto been but little noted. In Macht's own series its frequency is 4·6 per cent. Under treatment, a return to normal conditions is a favourable sign, and it is especially interesting to note that marked relief to dysmenorrhœa is experienced under tuberculin treatment.

It is not to be wondered at, considering the marked changes in the organism which take place at this period, that an effect is seen in the course of tuberculosis. Cough is aggravated, and congestive signs appear in the lung, making it more necessary than ever to be cautious in the administration of tuberculin, and (what is most interesting) there is a rise in temperature, and hæmoptysis. This *rise of temperature* is not peculiar to tuberculosis, but has been found by Riebold to be present in a variety of conditions, such as tabes and cancer of the stomach. The frequency of these febrile changes in tuberculosis varies from 12 per cent according to some observers, to as high as 50 per cent with others. The commonest form is the premenstrual rise which may occur a day or two before the flow, but menstrual and post-menstrual rises also take place.

Turban describes the premenstrual curve as preceding the period by three to five days, and looks upon it as almost diagnostic, a view which the studies of Riebold have made untenable.

Kessel,[23] studying a hundred cases under sanatorium treatment, found a menstrual rise in only four, in two of which it might be due to other complications. He considers, therefore, that too much stress has been laid upon this phenomenon, but apparently does not take sufficiently into account that these cases were under treatment, the benefits of which had produced a more normal type of temperature.

Macht considers that periodic *hæmoptyses* coinciding with the menstrual periods in the tuberculous are by no means so rare as reported. These hæmorrhages may occur simultaneously with the menstrual flow, but may also occur with suppression of the menses, being then what has been termed vicarious menstruation. These hæmorrhages,

though more common from the lung, may arise from other organs, e.g., ulcers in the bowel, at the particular time. It becomes a grave question whether vicarious hæmoptyses can take place with a perfectly sound lung, and though one must allow from the history of reported cases that this is possible, such hæmorrhages should always lead to a very serious suspicion of lung disease.

As regards treatment, the author advises that **Tuberculin** should not be administered at the time of menstruation.

For the use of **Hexamekol** to relieve pain, *see page* 18; **Ichthyol,** *page* 19; Nascent **Iodine,** *page* 23. The doubtful value of **Sea Voyages** is referred to on *page* 26. **Pantopon** is recommended for cough on *page* 30; and the effect of **Salvarsan** is recorded on *page* 56. For **X-ray** diagnosis, *see page* 69.

References.—[1]*Lancet* 1911, Dec. 17; [2]*Pract.* 1911, Mar.; [3]*Lancet.* 1911, Jan. 7; [4]*Ibid.* 1910, Dec. 31; [5]*Med. Rec.* 1910, Nov. 26; [6]*Deut. med. Woch.* 1911, Jan. 19 and July 13; [7]*Med. Press,* 1911, Feb. 15; [8]*Lancet,* 1911, July 15; [9]*Pract.* 1911, Sept.; [10]*Munch. med. Woch.* 1911, Feb. 28; [11]*Lancet,* 1911, Jan. 7; [12]*Brit. Jour. Tuberc.* 1911, Jan.; [13]*Brit. Med. Jour.* 1910, Oct. 8; [14]*Lancet,* 1911, Jan. 28; [15]*Ibid.* 1910, Nov. 19; [16]*Med. Rec.* 1910, Aug. 20; [17]*Ibid.* Dec. 31; [18]*Lancet,* 1911, Jan. 7; [19]*Brit. Med. Jour.* 1911, i, 6; [20]*Lancet,* 1910, Nov. 12; [21]*Glasg. Med. Jour.* 1911, Ap.; [22]*Amer. Jour. Med. Sci.* 1910, Dec.; [23]*Jour. Amer. Med. Assoc.* 1911, Ap. 29.

TUBERCULOSIS OF SKIN. *E. Graham Little, M.D., F.R.C.P.*

Grover Wende[1] reports a very unusual case of tumours of the hypoderm on the face in a middle-aged Englishwoman, which were shown by the presence of tubercle bacilli in sections, and by positive inoculation-tests in guinea-pigs, to be tuberculous. The tumours had persisted for five years, had never suppurated or changed in appearance, and were very favourably modified by **Tuberculin Injections.**

Reference.—[1]*Jour. Cutan. Dis.* 1911, 1.

TUBERCULOSIS OF TONSIL. (*See* Tonsils, Diseases of.)

TUBERCULOSIS, URINARY. *Francis D. Boyd, M.D.*

Tuberculin Treatment.—Cabot[1] points out that in general the use of tuberculin in tuberculosis of the urinary tract is not to be advised (*see Medical Annual,* 1911, p. 425), and little benefit can be expected in the presence of massive tuberculous lesions from which constant reinfection can occur. These lesions can be dealt with surgically. The cases in which tuberculin may be used with benefit can be divided into two classes: (1) Those in which the disease has been apparently completely removed, as in unilateral kidney affections without bladder involvement. Here its use has resulted in permanent and prompt wound healing, in contrast to cases in which a sinus follows operation. Tuberculin saves much time and anxiety to the patient. (2) Those cases in which, though the principal focus of the disease has been removed, a certain amount still remains. As types, unilateral kidney lesions with bladder involvement, and unilateral lesions of the epididymis and vas with involvement of the prostate,

may be taken. Tuberculin is then a very distinct addition to the methods of after-treatment. Tuberculin treatment should be begun immediately after operation. Its use results in perfect wound healing and noticeable absence of troublesome sinuses. Injection should always be begun with minimal doses, generally about 0·005 mgram, a dose so small as to produce no reaction. The dose is then fairly rapidly increased, till 0·1 mgram is given, the interval between injections being at first three or four days, later about a week. The injections are continued and the dose increased till the patient receives 10 mgrams, always provided no reaction occurs. This point is ordinarily reached in about three months, when in cases of the first class the injections are discontinued and the patient is discharged. In cases of the second class, the injections are generally continued at a maximum dose until the patient is free of symptoms or six months have elapsed. Then the injections are discontinued in order to get the benefit of intermittent rather than continuous treatment.

REFERENCE.—[1]*Bost. Med. and Surg. Jour.* 1910, 471.

TUMOURS, CEREBRAL. (*See* BRAIN.)

TYPHOID FEVER. *E. W. Goodall, M.D.*

ETIOLOGY.—W. H. Hamer[1] reports on certain localized prevalences of typhoid fever in London in 1910. A minute enquiry into the circumstances of each of the cases notified led Hamer to incriminate certain *fish* as the source of infection. The particular fish was plaice (including flounders and dabs), and especially small plaice from certain areas in the North Sea in the vicinity of the mouth of the Elbe. The fish was usually fried for consumption. In most instances it was bought already fried, but in some in the wet state. It appears that "plaice is practically the only fish used by vendors of fried fish which is not gutted as a matter of course at sea."

PATHOLOGY.—In a paper on the *bacteriology of human bile* with especial reference to the typhoid carrier problem, J. F. Windsor[2] gives the results of the bacteriological examination of the contents of the gall-bladder in 103 cases, in 89 when removed from the dead body, and in the remaining 14 at the time of operation for cholelithiasis. The causes of death in the 89 cases were various. In 23 cases the contents were sterile. In 51, *B. coli* was isolated in pure culture. In four, *B. coli* was found associated with other organisms. In four cases only were members of the typhoid-paratyphoid group found, these being *B. typhosus* twice and *B. paratyphosus A* twice. Not one of these four cases was definitely known to have had typhoid fever.

SYMPTOMS.—Two additional cases of "typhoid spine" have been recorded by T. McCrae[3] and one by N. B. Potter.[4] Both writers give copious references to cases previously reported. The latter also discusses the condition in detail, under the following headings: (1) *Local swelling* (26 per cent of the cases), with tenderness, occasionally also redness, and always with rigidity; (2) *Changes in the spine,*

kyphosis (36 per cent); in some cases scoliosis; (3) *Evidences of involvement of the nerve-roots*; (4) *Radiograms*. These show definite evidence of bony changes in a sufficient number of cases to make it highly probable that in most, if not all, such changes are present; (5) *Suppuration*; this is very rare, in fact no case has so far been published in which it was definitely proved that the suppuration had its origin in the affected portion of the spine. (6) *Treatment*. Patients who are convalescent from typhoid fever should be warned against engaging in any occupation which will throw strain on the spine. For the condition itself the essential thing is to relieve pain and protect the spine by immobilization. This can in most cases be secured by a **Plaster Jacket,** which should be applied while the patient is in the recumbent position, and not by the suspension method. This treatment should be begun as soon as possible after the disease has shown itself. In cases in which the jacket fails to relieve—and in some it will not only fail but will even increase the pain—**Counter-irritation,** especially in the form of the **Paquelin Cautery,** should be tried. Sedatives seem usually to have no effect. McCrae suggests the use of **Vaccines** in the same dosage as in antityphoid vaccination.

Bayard Holmes[5] reports a case of *cholecystitis* due to the *Bacillus typhosus*, in which there were no symptoms of typhoid fever at the time, nor was there any history of typhoid in the patient previously.

A case of a rare variety of perforation of the intestine is recorded by Goodall.[6] The abdomen was opened because there were signs of peritoneal infection; evidences of early peritonitis were discovered, but without any perforation so far as could be seen. The abdomen was therefore closed. Several weeks after this it became necessary to open a large foul abscess, containing gas, on the left side of the abdomen and chest. The patient, however, died. The post mortem showed that an extraperitoneal perforation of the descending colon was responsible for the suppurating focus.

Diagnosis.—Attention was drawn in the *Annual* for 1908, p. 593, to the value of *Russo's test* in the diagnosis of typhoid fever. The test consists of adding four drops of a 0·1 per cent aqueous solution of methylene blue to 4 or 5 c.c. of the patient's urine; after thoroughly mixing, the liquid, when examined against the light, shows an emerald green colour, in which there should be no trace of blue. The reaction is present in typhoid fever, measles, small-pox, and in some cases of tuberculosis. It is stated that, as the patient recovers, the green gives way to a blue colour. F. W. Rolph and W. H. Nelson[7] have recently made further investigation into the efficacy of the test in cases treated in the Toronto General Hospital. They give a list of 15 cases of typhoid fever in which the test was employed. It was positive in 13, within forty-eight hours of admission to hospital, whereas, *at the same time*, the diazo reaction was positive in 5 and the Widal in 6 cases only. The day of disease varied from the third to the twelfth. Positive results were also obtained in a few cases of tuberculosis, but the results were always negative in cases of influenza, endocarditis, and slight

septic states. They discovered one fallacy in the test, viz., that urines containing bilirubin will give a reaction which differs so slightly from the typical green that they cannot be used for the test. They did not find the return of the bluish tinge of much assistance in prognosis.

Hultgen[8] has studied the *leucocytic condition of the blood* in the early stages of typhoid and paratyphoid fevers. His observations were made upon 7 cases of typhoid, 7 of paratyphoid, and 25 normal persons. He finds the following points characteristic of the typhoid and paratyphoid group of diseases: (1) A leukopenia from the beginning, deepening gradually up to the fourth, fifth, and sixth week; (2) A moderate initial polynucleosis, lasting 24 to 48 hours, in uncomplicated cases, 67 to 78 per cent of polynuclears being encountered; (3) Very early, but not initial, mononucleosis, progressive and marked, well into the fifth, sixth, and seventh week; (4) A well-marked, early and persistent increase of the large mononuclears; (5) The eosinophiles are absent, early and persistently, until signs of recovery appear. They disappear abruptly with the onset of the fever, and reappear very slowly. Eosinophiles and bacilluria are evidently incompatible.

Treatment.—Several papers on the subject of the treatment of typhoid fever by **Vaccine** have recently been published. They are all by American authors, probably because the very widespread prevalence of typhoid in the United States affords a larger field for observation than in this country, where the disease is yearly becoming less frequent. Perhaps the most important contributions are those of W. H. Walters and C. A. Eaton,[9] and of J. G. Callison,[10] because reproductions of the actual temperature charts of several of the cases are given, and in consequence the reader is able, to a certain extent, to judge for himself of any effect of the vaccine. Walters and Eaton report 35 cases treated in this way, with no deaths. From the charts it certainly seems that some of the cases were severe, and that a beneficial effect was produced by the vaccine, and that with some rapidity. In some of the cases, however, it does not appear from the charts that the vaccine produced any marked effect. The dose was from 25 to 30 million bacilli, repeated if necessary at intervals of three or four days. In a few cases smaller doses were given, but according to the charts the best results appear to have followed the larger doses. Most of the patients had been ill for at least a week when the specific treatment was commenced. The authors give a table of all published cases of typhoid fever treated with vaccine, both in England and America. Excluding 68 cases (Richardson's), because the number of fatal cases is not given, and also because there is some doubt as to the nature of the vaccine, the table shows 190 cases with 9 deaths. To these we may add 14, with 2 deaths, recorded by J. F. Fletcher, which makes a total of 204 cases with 12 deaths, a fatality of 5·7 per cent; which is certainly low, but by no means unknown with other forms of treatment. Fletcher[11] gave a first dose of 500 million, followed by another after several days, when necessary, of 1000 million. J. M. Anders (8 cases with no deaths, included in Walters' and Eaton's

table) gave initial doses of 25 million bacilli, with subsequent doses of 50 million. In his cases the clinical results do not appear to have been so striking.

Callison treated 24 cases by this method, but excluding 3 (all recoveries) in which there was some doubt, there were 21 cases with 3 deaths and 1 relapse. This fatality of 14 per cent is not at all out of the way. The dosage he employed ranged from three injections of 25 million bacilli to five, increasing from 600 to 1000 million. His recommendations as to dosage are as follows: "Give a first injection of 300 million as soon as the diagnosis is made. The injections may be given every third or fourth day, increasing 100 million each time, until 1000 million is given at a dose." There is usually a local reaction, which is sometimes severe, after an injection. It lasts for from twenty-four to seventy-two hours. Callison concludes that inoculations of vaccine prevent relapses and lessen complications, and in some cases probably also shorten the original attack; that stock vaccines should be given in preference to autogenous vaccines, and that the older the culture the better; that given in therapeutic doses, such stock vaccines are without injurious effect, and do not interfere with other treatment; that the dosage used by many of those who have treated typhoid with vaccines in the past has been too small to secure the best possible results; and that every case of typhoid fever should receive vaccine treatment as soon as a diagnosis is made, and this should be continued until the temperature becomes normal or it is demonstrated that the case will not respond to this form of therapy. His paper brings Walters' and Eaton's list of published cases up to date, from which it appears that there have been 323, with 20 relapses and 17 deaths. He also gives a complete bibliography.

Two cases in which a *typhoid carrier* has been rendered apparently free from bacilli by the repeated injections of typhoid vaccine are reported; the first by Meader[12] and the second by Clements and Dawson.[13] In the first case, during the period Dec. 5th, 1909, to Feb. 2nd, 1910, an autogenous typhoid vaccine was given in doses varying from 25 to a 1000 million bacilli, at intervals of one to two weeks; on Feb. 9th the stools were found to be free from typhoid bacilli, and remained so, at any rate till the date of the publishing of the paper, Sept., 1910. The agglutinative and bactericidal properties of the patient's serum were worked out in detail. The second case is that of a British soldier who suffered from typhoid fever from September to November, 1909. After recovery he was found to be a carrier, and bacilli were intermittently present in the fæces. Early during convalescence there were symptoms of cholecystitis. Vaccine treatment was begun on February 23rd, 1910, and continued till May 10th, 1910, and six doses, increasing from 125 up to 600 million bacilli, were given during that period. On May 15th there were marked symptoms of cholecystitis, which did not pass off till the third week of June. After May 17th the stools were found to be free from bacilli, except on May 25th, and doubtfully on May 30th and 31st, and again on June

20th. After this date, though very frequently sought for, no typhoid bacilli could be found up to the date on which the paper was published (April, 1911). In this case it seemed as if the source of the bacilli was the gall-bladder. The writers conclude the paper by stating that "it is certain that the cholecystitis (of May 15th) was the immediate cause of freeing the gall-bladder of all foci of infection."

Prophylaxis.—The practice of **Inoculation** against typhoid fever is yearly gaining ground. At one time confined almost entirely to the British Army in India, it has now been extended not only to the armies of other nations, but also to a certain extent to civil bodies, British and foreign (e.g., nurses, missionaries). Hence data bearing on the efficacy of the method are accumulating. The finer statistical methods of Karl Pearson have recently been applied to antityphoid inoculation by Firth.[14] The figures he deals with relate to all the European troops in India from July 1st to December 31st, 1910. The number of men during the September quarter, exclusive of those who were known to have suffered previously from typhoid, was 67,442. Of these 55,368 had been inoculated and 12,074 had not. Of the former 61 were attacked with typhoid, of the latter, 45. In the December quarter the figures are 58,481 inoculated, with 34 attacks, and 10,927 not inoculated, with 22 attacks. Firth writes, "Regarded in this way, the results are good, and warrant the view that there is a very definite correlation between inoculation and freedom from attack." For his statistical deductions the original paper must be consulted. He thinks that at least one-third of the cases classed under enterica will be found to be really infection by the bacillus known as *B. paratyphosus A*. None of the recognized paratyphoid cases died. In respect of the relation between inoculation and recovery from attack of typhoid, the figures are small. Of 195 inoculated men attacked, 22 died, and of 130 non-inoculated, 25 died. Firth gives figures and curves which suggest that there has been a very definite postponement, after arrival in India, of the maximum incidence of the disease, and that, roughly, the maximum occurs eighteen months later than it did formerly. "If any deduction is permissible, it is that there is a definite inhibitory force at work among the inoculated population during the first thirty months, but that this inhibitory force is weakening between the second and third years after the operation." Lastly, the writer recommends the adoption of "steady and persistent re-inoculation of all men who have been inoculated more than thirty months," a measure which, it appears, is now to be carried out.

It may be useful briefly to mention the *method of inoculation* now practised in the Army. The vaccine is made from cultures of typhoid bacilli not more than forty-eight hours old. These are sterilized at 53° C. After they have become cold, 0·4 per cent of lysol is added. Vaccine should not be employed within three weeks nor after three months from the date of its preparation. The vaccine is usually injected under the skin opposite the insertion of the deltoid on the left side, but occasionally at other places. The first dose consists of 500 million

bacilli, and the second, given ten days later, of 1000 million. Sometimes a third injection of 1000 million is given. In the Army the time selected for the inoculation is 4 p.m. The soldier goes to bed at about 8 p.m., when the reaction is beginning to appear. He is put on " light duty " for two days, the reaction seldom being severe enough to prevent him from doing the work this duty entails. There is practically no negative phase following inoculation. The reaction consists (1) of a localized hyperæmia rarely attended with œdema ; and (2) moderate pyrexia, malaise, and chilliness. Occasionally these symptoms are more severe. They all pass off within forty-eight hours of the inoculation. M. W. Richardson and L. H. Spooner[15] give an account of the results of the inoculation of nurses in several American hospitals. They strongly advocate the practice. They state that " latent or chronic infection of non-typhoidal character may be lighted up by the typhoid inoculations," and they mention four instances, three of arthritis and one of cholecystitis. Langrishe[16] took five men who had been inoculated two years previously, and found that the blood-serum of four of them agglutinated typhoid bacilli when it was diluted only up to 1–20. In the course of three months, after re-inoculation, the agglutinative reaction of the serum rose from 1–800 to 1–1000, after which it fell. In the fifth case the power rose to 1–200 in one month.

Middleton[17] concludes from experiments on rabbits that " the influence of temperature on the efficiency of typhoid vaccines is a very definite one. . . . It would seem, from the few experiments that have been done with this form of vaccine, that a chemical change which renders them inert takes place when they are produced at too high temperatures." He suggests that the optimum temperature for the production of typhoid vaccines is the lowest temperature at which the bacillus typhosus can be killed ; that is from 53° to 55° C. for one-half to one hour.

REFERENCES.—[1]*L.C.C. Rep.* No. 1407 (P. S. King & Son, Westminster), Typhoid Fever in London ; [2]*Quart. Jour. Med.* 1911, Jan. ; [3]*Johns Hop. Hosp. Bull.* 1911, Mar. ; [4]*Med. Rec.* 1910, Dec. 17 ; [5]*N.Y. Med. Jour.* 1911, ii, 315 ; [6]*Ann. Rep. Met. Asyl. Bd.* 1910, 264 ; [7]*Med. Rec.* 1911, ii, 373 ; [8]*Amer. Jour. Med. Sci.* 1911, Aug. ; [9]*Med. Rec.* 1911, May 6 ; [10]*Ibid.* 1911, June 24 ; [11]*Jour. Amer. Med. Assoc.* 1911, Ap. 15 ; [12]*Johns Hop. Hosp. Bull.* 1910, Sept. ; [13]*Jour. R.A.M.C.* 1911, Ap. ; [14]*Ibid.* 1911, June ; [15]*Boston Med. and Surg. Jour.* 1911, Jan. 5 ; [16]*Jour. R.A.M.C.* 1910, Dec. ; [17]*Therap. Gaz.* 1911, July, 473.

TYPHUS FEVER. *E. W. Goodall, M.D.*

Last year, under the heading of the diagnosis of typhoid fever, attention was drawn to a disease which in the United States is known as " Brill's Disease." This is certainly not a form of either typhoid or paratyphoid fever. But clinically it bears a very close resemblance to typhus,—if indeed it is not a variety of that disease. One of the characters emphasized by Brill was the want of virulence as shown by the absence of fatal cases amongst the 221 he had observed.

But this year he is able to give an account of a fatal case.[1] This was one of 34 additional cases observed since he wrote his first paper on the subject. A very full account of the clinical history of the case is given, together with the pathological and bacteriological findings. Nothing definite was found. "The organs showed congestion and general parenchymatous degeneration, such as would obtain in any intense infectious disease." After narrating this case, Brill makes the following very candid statement. "The appearance of the patient on the last day of her illness, with the clinical picture of coma, petechial eruption, carphology, paralysis of the sphincters, and the rapid elimination of the heart action, recalled to my mind two other fatal cases on my hospital service with a similar picture: one occurring in March, 1902, and one in May, 1903, the former a female, the latter a male. Both of these patients were brought to the hospital in stupor, and were diagnosed by me as typhus fever." Brill gives a detailed account of these two cases, so one is able to judge of their resemblance to the others. I think it may now be stated fairly that the disease may occasionally be fatal. True, the fatality of Brill's cases is very low, 3 out of 257 (I include the two fatal cases of 1902 and 1903). But we hardly know the actual fatality of typhus, for the disease was practically extinct before notification was introduced, and the fatality given by Murchison and other writers is that only of cases admitted to hospital. Infectious diseases vary enormously in their fatality from time to time.

It is certainly curious that, with a single exception, no two cases of the disease have been observed by Brill in the same family or the same house, from which it may be concluded that the disease is not communicable from one person to another. But it should be remembered that sporadic cases of typhus of a mild type have often proved to be non-infectious. For instances in which the disease has not spread when it might have been expected to do so, I may refer to the Report on the Hospitals of the United Kingdom, made by Bristowe and Holmes[2] to the Privy Council in 1864.

The absence of evidence of contagion or infection is therefore not an absolute proof that in Brill's disease we are not dealing with typhus.

Bearing in mind the recent experimental work of Nicolle, Goldberger and Anderson, and Ricketts and Wilder, on the infectivity of the blood in typhus fever, Brill, in conjunction with R. Ottenberg, inoculated five monkeys with blood taken from patients suffering from Brill's disease; but none of the animals became infected. Some observers would have taken these negative results as proofs of the non-infectious nature of the malady; but Brill, with great fairness, prefers to wait for further experiments before pronouncing a final opinion. With an equally open mind he concludes his paper with the following words: "I could assert that, inasmuch as clinically the disease is similar to typhus fever, though the experimental evidence would appear to negative their identity, I still reserve in my mind the belief in the possibility of the development of an attenuated modifica-

tion of the virus of typhus fever. This attenuation in virulence could, I imagine, be induced by environment and improved sanitation to such a degree as to change to a great extent the clinical characters of typhus fever and the biological nature of its infectious agent."

Lauria[3] gives a detailed account of three cases, and a short analysis of eighteen of the same disease.

References.—[1]*Amer. Jour. Med. Sci.* 1911, Aug.; [2]*Sixth Rep. of the Med. Off. of the Privy Council*, 538, 539; [3]*Med. Rec.* 1911, ii, 424.

ULCERS. *Priestley Leech, M.D., F.R.C.S.*

Staige Davis[1] makes a further statement as to the results obtained in treating granulating surfaces by means of **Scarlet Red.** He gives a historical résumé of the experimental and clinical use of this agent. He finds marked epithelial stimulation even when the wounds are unhealthy and the discharge is profuse, though the most rapid results are obtained on flat granulating surfaces. He has found advantage in using scarlet red put up in balsam of Peru ointment, blue ointment, iodoform ointment, etc.

Technique.—Cleanse the wound thoroughly with boric or salt solution, and dry. If the granulations are unhealthy, peroxide of hydrogen may be used before the boric solution. Silver nitrate stick may be freely used to keep down excessive granulations. Tr. iodi U.S.P. strength, may follow the silver nitrate or be used on alternating days. It is a powerful and rapid means of cleansing granulations. The strength of scarlet red ointment ordinarily used is 8 per cent; it should be alternated every 24 to 48 hours with some bland ointment. A 4 per cent strength can be employed over longer periods without danger of the severe irritation which occasionally occurs. The most satisfactory method is to anoint the skin surrounding the defect with some bland ointment up to about one centimetre of the wound edge, as this prevents possible irritation. Then spread the scarlet red mixture in a thin layer on perforated old linen, and apply to the wound, either along the edges or over the whole surface. A light dressing of sterile gauze secured by a bandage completes the procedure. Davis has also applied the scarlet red ointment to a number of wounds, and then exposed them to the air and sunlight. The healing is very rapid, and the drying out of the surface is most noticeable. It is safe to use a 4 per cent strength on partial skin grafts of all kinds, 48 hours after grafting; this produces rapid stimulation of the wound edges and also of the grafts themselves. As a rule there is no toxic effect from either scarlet red or amido-azotoluol. A simple and satisfactory method of preparing both scarlet red and amido-azotoluol is to rub them up with a small amount of almond oil until the mass is smooth, and then mix this mass thoroughly with the base. Both preparations can be sterilized without interfering with their stimulating properties. The gauze is prepared by being saturated in a 4 to 8 per cent alcoholic solution

of the substances, and then allowing it to dry. A dusting-powder can be made by adding to boric powder 4 to 8 per cent of the scarlet red. In syphilitic ulcers scarlet red can be used with advantage with blue ointment. (*See also page* 58.)

E. Graham Little, M.D., F.R.C.P.

Manual Treatment.—Dividing ulcers into: (1) Simple inflammatory: (2) Infective or specific; and (3) Malignant; Cyriax[2] found that with the first class, and probably also with tuberculous ulcers which belong to the second type, manual massage after the Swedish principle acted very beneficially. The manipulations used were: (1) On and around the ulcer; (2) On the affected limb or part; (3) General constitutional movements. The type of movement used may be classed as: (*a*) Stationary vibrations, with the hands placed in the near vicinity of the ulcer, and the fingers thrown into rhythmic contractions, ten to twelve in a second; (*b*) Concentrating vibration, in which either one or both hands may be used, and the fingers travel over the skin, or roll the skin with them. The result of these movements will often be visible in a flow of lymph over the ulcer which is the object of the treatment. These movements may be conducted over the ulcer itself by interposing lint between the surface and the operator's hand. The duration of the local treatment is about fifteen minutes, and cure should result in from a few days to two months.

Varicose Ulcers.—Weiner[3] remarks that there are three factors in treatment: (1) The ulcer; (2) The skin surrounding the ulcer; (3) The venous stasis. Compression in some form is always necessary, whether by gelatin paste, plasters, elastic or other bandaging. The following ointment may be applied to the surrounding skin if the latter is unchanged:—

R	Zinci Oxidi Amyli	āā 30	Glycerini Aq. Dest. Adipis Lanæ Ung. Cer.	āā ad 100

When the surrounding skin is already altered, if there is simple erythema a 5 per cent. **Tumenol-Vaseline** may be used. When there is definite eczema, ointments are contraindicated; if there is much weeping, the surface should be painted with 2 to 10 per cent solution of **Silver Nitrate,** and then a 5 per cent **Tumenol Zinc Paste** applied. For dry thickened eczema of the surrounding skin, Wilkinson's ointment is useful:—

R	Ol. Betulæ Sulph. Præcip.	āā gr. x	Soft Soap Lard Chalk	āā gr. xx gr. v

For the ulcer itself, **Zinc Perhydrol** (Merck) dusted on the surface, or the following ointment, may be used:—

R	Scarlet Red Tere. c. Chlorof.	4 95	Ung. Lenicet	ad 100

This can be kept on for three days ; it may be followed by :—

R	Arg. Nitr.	1	Vaselini	ad 100
	Bals. Peruv.	5		

For painful ulcers, 5 per cent "**Propasin**" may be added to these formulæ.

For the use of **Novoiodine** locally, *see page 26*.

References.—[1]*Johns Hop. Hosp. Bull*, 1911, 210 ; [2]*N.Y. Med. Jour.* 1911, ii, 978 ; [3]*Deut. med. Woch.* 1911, i, 1081.

UMBILICUS. (*See* Abdominal Wall.)

URETERS, DISEASES OF. *J. W. Thomson Walker, M.B., F.R.C.S.*

Congenital Stricture.—Bottomley[1] gives an extract of fifty-six records of cases collected from the literature and other sources. The three important factors in embryology are : (1) The early common cloacal termination of the rudimentary genito-urinary and intestinal tracts, and their subsequent complete separation ; (2) The primary origin of the ureter from the Wolffian duct, which in the male represents the future vas deferens, ejaculatory duct, etc. ; (3) The early common opening of the ureter and Wolffian duct in the embryonic bladder and their later acquisition of separate openings, at first close together, but finally far apart. An arrest or failure of development may have to do with a ureter opening or intended to open (*a*) into the intestinal tract, (*b*) into the genital tract, or (*c*) into the bladder or elsewhere, usually in connection with some remains of the Wolffian duct. Bottomley's article deals only with the ureters opening into the bladder under the third category.

The condition is found more frequently in males and in subjects under five and over sixty. Most frequently the lesion affected a single ureter, occasionally a supernumerary ureter. The left side was more frequently affected than the right. In the majority of cases the stricture was situated at, or close to, the lower end of the ureter. In the bladder there may be a dimple or pocket, or sometimes a cyst-like protrusion. The ureter is dilated, thin-walled, and tortuous, and the kidney either hydronephrotic (the rule) or atrophic. The symptoms are irregular and inconstant. The most common complaint is frequent micturition. Occasionally hæmaturia has been observed. Pain in the loin and a renal tumour lead to a diagnosis of hydronephrosis. There may be retention of urine and distention of the bladder, or a median pelvic tumour may be discovered which is due to a cystic ureter, and which does not disappear on passing a catheter. In no case was the diagnosis made previous to operation.

Treatment.—This must vary with each case. Some require nephrectomy and ureterectomy. Nephrostomy may serve as an emergency measure. Cystic protrusions into the bladder are treated after cystotomy, and the author recommends the intraperitoneal method.

An instructive example of *supernumerary ureter* opening on the left

side of the vestibule behind the urethra in a fifteen-year-old girl is described by Cristofoletti.[2] The opening was a dimple in the mucous membrane, and clear fluid was seen discharging from it. On laparotomy a ureter dilated to the size of the small intestine was seen on the left side. This was prepared and cut across, and the upper end implanted into the bladder.

Ureteral Calculus. — Necker and Gagstatter[3] have studied the symptoms and treatment of calculus in the pelvic portion of the ureter. In fifteen cases calculi were removed by extraperitoneal ureterolithotomy, in one case by vaginal ureterolithotomy, and in one through the female urethra after digital dilatation. A review of the symptoms shows that they were very vague in some cases and only led to a tentative diagnosis of calculus of the urinary tract. In rare cases the first indication was infection of the urinary tract, shown by rigors and fever. Typical ureteral colic was characteristic but rare. In some cases there was renal pain, followed by ureteral colic, and later by bladder symptoms ; in others colic followed by polyuria due to the relief of obstruction, or pain radiating from a point in the lower part of the abdomen up to the loin. The presence of microscopical hæmaturia increased by movement and accompanied by a corresponding albuminuria, as pointed out by Israel, was observed in all cases. Appendicitis was so frequently erroneously diagnosed, that it could be laid down as a rule that if the symptoms did not at once disappear after an operation for appendicitis, a radiographic examination should be made. Cystoscopically a stone may be seen projecting from the ureter, or there might be a ballooned ureter or other changes. On the whole, however, the authors found the information gained by cystoscopy was limited. Sounding the ureter as a method of diagnosis was unreliable if used alone, for the sound might be arrested at some point where no stone was present, and the method of passing a wax-tipped bougie which would show scratches caused by a calculus was only of historical interest. Radiography was the most important diagnostic method, and the whole urinary tract should be examined. Difficulties in reading the radiographic plate were due to shadows thrown by phleboliths, enteroliths, and calcified glands, and in order to distinguish between these and a calculus shadow, a ureteric bougie opaque to the *x*-rays should be passed (*see Plates XXVI, XXVII, XXVIII*, page 365). Pure uric-acid stones threw no shadow, and might only be found on exploration of the kidney and ureter by operation. The extra-peritoneal operation is the best, and is carried out by an incision extending from a little above and two finger-breadths internal to the anterior superior iliac spine, curving downwards parallel to Poupart's ligament, and reaching the middle line at the symphysis pubis. Deeply-seated stones are most difficult, and in five cases it was necessary to obtain help from the finger of an assistant in the vagina or rectum. Long drainage tubes should not be used, lest pressure be exerted upon the iliac artery. Drainage of the ureter by a ureteric catheter is unnecessary. Intramural ureteral stones

should be removed through the urethra in the female, or by incision of the ureteric papilla after suprapubic cystotomy in the male, but only after a full trial of conservative methods, such as the injection of glycerin and dilatation of the ureteric orifice. By adding the fifteen cases of extraperitoneal ureterolithotomy to those collected by Jeanbrau (sixty cases, with one death), a mortality of 1·35 per cent is obtained.

Cabot[4] discusses the technique of operations for stone in the ureter. For calculi arrested just below the pelvis of the kidney, he advises an oblique "muscle-splitting" incision beginning about the tip of the twelfth rib, and running downward and forward to a point midway between the anterior superior spine of the ileum and the umbilicus. The fibres of the external oblique are separated in the line of the incision, and those of the internal oblique and transversalis at right angles to it. The peritoneum is pushed back, and the ureter found lying on the psoas muscle. To reach stones at the brim of the pelvis the incision is in the same line, but begins where the other stopped, and passes downwards to the junction of the inner and middle thirds of Poupart's ligament. For stones at the lowest part of the ureter the incision begins at the middle line a finger's breadth above the pubes, and runs horizontally outward nearly parallel to Poupart's ligament, and curving sharply upward at its mid-point, ends opposite the anterior superior iliac spine. The aponeurosis of the external and internal oblique muscles is divided, and at the outer end of the incision a few fibres of the internal oblique are cut across. The fascia of the transversalis is divided vertically close to and parallel to the rectus. Most authorities (Albarran, Jeanbrau, etc.) advise incising the ureter upon the stone with the view to causing less damage. Cabot prefers to incise the ureter one or two inches above the stone, and considers that suturing is easier and more secure. The permeability of the ureter should be ascertained. The author does not advise placing a catheter in the ureter, and in three cases he has not used any drainage of the abdominal wound. He hesitates, however, to recommend this for general use.

Treatment of the Ureter in Nephrectomy.—Fowler[5] relates an unusual case of *empyema of the ureter after nephrectomy*. The left kidney had been removed on account of calculous pyonephrosis. Empyema of the left ureter developed as a result of the presence of a calculus, which was demonstrated by the *x*-ray and had been forgotten at the operation. Right pyonephrosis resulted from ascending sepsis, and both ureteric orifices showed peristaltic movements, with the discharge of thick pus. Anuria developed, and was relieved by nephrotomy. Empyema of the ureter after nephrectomy is rare, and Israel only found four cases in 900 nephrectomies.

According to Lilienthal,[6] the attitude of most surgeons regarding the disposition of the divided ureter after nephrectomy seems to indicate a strange unwillingness to complete the operation in a scientific and radical manner. Of the necessity for its removal, especially in cases of tuberculosis, he is fully convinced. Repeat-

edly he has seen lumbar sinuses and abscesses as well as retro-vesical suppuration following the incomplete extirpation of a tuberculous ureter. He has also encountered cases of tuberculous cystitis with the characteristic dysuria and hæmaturia and with tubercle bacilli in the urine, in which nothing but a stump of the diseased ureter had been left following nephrectomy, the other kidney being comparatively healthy. The cystoscopic picture in these cases is the same as it was before the operation. The author is convinced that if the removal of the diseased ureter were made easy and rapid, total nephrectomy would be the routine procedure. With this object in view he advocates the following operation:—

Extraperitoneal nephrectomy is performed, the ureter is cut between two ligatures, and the stump cauterized with 95 per cent phenol. The ureter is now drawn out of the wound, and the ligature having been removed, a good-sized flexible urethral bougie with conical or olive point is passed down toward the bladder. A ligature is tied tightly around the ureter and instrument to hold the bougie in place and prevent the leakage of infected fluids from the canal. The greater part of the lumbar wound is now closed and the patient turned on his back. An oblique incision of $1\frac{1}{2}$ to 3 inches, according to the thickness of the abdominal wall, is made about an inch to the median side of the anterior superior iliac spine, and carried through the abdominal muscles to the peritoneum, and then the gloved finger works its way extraperitoneally down to the ureter, which is easily felt and drawn out of the wound. An assistant withdraws the instrument from the nephrectomy wound and tightens the ligature. A gentle pull will draw the upper portion of the ureter out of the inguinal wound, and it may then be easily followed down to the bladder, where it must be firmly ligated and cut off, the mucosa being disinfected with phenol. The latter part of the operation may be performed under the guidance of the eye by elevating the foot of the table and exposing the depths with retractors. The wound is closed with a very small drain down to the bladder for forty-eight hours.

References.—[1]*Ann. Surg.* 1910, 597; [2]*Wien. klin. Woch.* 1910, 1510; [3]*Ibid.* 1911, 268; [4]*Bost. Med. and Surg. Jour.* 1910, ii, 788; [5]*Ann. Surg.* 1911, 378; [6]*Ibid.* 1911, 521.

URETHRA, SURGERY OF *J. W. Thomson Walker, M.B., F.R.C.S.*

Stricture.—Hey Groves[1] warmly advocates excision. He has performed the operation in six cases with success. Suprapubic drainage of the bladder should be used where there is cystitis and when an instrument cannot be passed through the stricture. A ⊥-shaped incision is used and three flaps are reflected. The ejaculator muscle is divided in the median line and its two halves are turned outwards.

The excision, suturing, and anastomosis must involve the whole thickness of the spongy body, and not consist in an attempt to deal with the urethra inside the tissues of the corpus spongiosum. The only limit to the length of spongy body and urethra that can be removed

is the disproportion produced between the lengths of the spongy and cavernous bodies. If this is too great, a downward bend will be given to the penis when in a state of erection. This soon rights itself.

Gibson[2] prefers a modification of Cock's operation of external urethrotomy without a guide, to the more frequently performed Wheelhouse operation. After opening the urethra posterior to the stricture by the median stab incision, he introduces the beak of an instrument resembling a Bellocq cannula into the urethra, and directs it towards the back of the stricture; through this a filiform is introduced and passed through the stricture from behind forwards. On this filiform the straight staff of a Fluhrer urethrotome is threaded from before backwards and passed down the penile urethra and through the stricture, which is then cut by a urethrotome blade.

Treatment by **Ionization** is recommended on *page* 95.

Rupture of Male Urethra.—Gaub[3] concludes that (the condition of the patient permitting) immediate operation to restore the integrity of the urethral canal is imperative, and this should be carried out through a median perineal incision. Cabot[4] holds that it is unwise to attempt primary suture of the urethra because of the damaged condition of the tissues. It is important, he believes, to restore the continuity of the roof of the urethra if this has been torn across.

Pathological Conditions of Verumontanum and Prostatic Utricle—These may cause symptoms usually looked upon as due to chronic prostatitis, such as precocious, painful, or frequent emission, neuralgic pains in the perineum, groin, etc. Geraghty[5] has introduced a fine syringe by means of which he injects through a straight urethral tube solutions of nitrate of silver into the prostatic utricle.

References.—[1]*Brist. Med.-Chir. Jour.* 1910, 325; [2]*Med. Rec.* 1910, ii, 226; [3]*Jour. Amer. Med. Assoc.* 1910, ii, 2048; [4]*Ibid.*; [5]*Ibid.* 1911, Mar. 11.

URINARY TUBERCULOSIS. (*See* Tuberculosis.)

URINE, EXAMINATION OF. *Francis D. Boyd, M.D.*

Acidity.—The acidity of the urine as estimated by Joulie's reactions and its reference to morbid conditions, is the subject of a communication by Graham Little.[1]

Rationale.—Joulie's most important contribution to knowledge has been the demonstration of a greatly improved method of testing the "physiological" acidity of the urine which serves as an index to the acidity of the blood. In order to have the minimum disturbance of the acidity by ingestion of food, the urine to be examined is that passed on waking, without admixture with any other; and in order to avoid the alteration of acidity produced by bacterial change it must be fresh, and must in fact be examined within two hours of being passed. Only under these conditions can the urine be regarded as a faithful reflex of the blood. The view that the blood is chemically an acid fluid is argued by Joulie, in opposition to the alternative theory of its alkalinity, on the ground that, although the blood is akaline to litmus,

it contains in solution salts, calcium and magnesium phosphate, which are chemically acid, and are precipitated in alkaline solution. The normal acidity of the urine is chiefly due to the presence of monobasic acid sodium phosphate, and its degree is estimated by the power of the urine to dissolve calcium phosphate, which Joulie calls its physiological acidity. This is tested by adding a clear solution of calcium saccharate drop by drop to the urine, while in agitation, which will dissolve the precipitate of tri-calcium phosphate (which is at first formed) "so long as there is a sufficiency of the acid phosphate of sodium to combine and produce the soluble mono-calcium phosphate "(Martindale).

The large group of general diseases described by Bouchard as being due to retardation of nutrition may then be divided into two classes, according as the urine passed on waking is hyper- or hypo-acid. If the urine is hypo-acid, it will not hold the magnesium and calcium phosphates in solution ; if hyper-acid, the urates will be decomposed and uric acid be precipitated. If the blood is hypo-acid (due to excess of bicarbonate and alkaline phosphates), it becomes thinner, leading to a rapid pulse, increased oxidation, and organic change ; if hyper-acid (due partly to increased production of organic acids), the blood is more viscous, the circulation is slower, and oxidation and tissue change are diminished.

Technique.—A mixture of 20 grams of freshly slaked lime, 25 grams of crystallized sugar, and 1 litre of distilled water is made and allowed to stand for twenty-four hours, and then filtered. The alkalinity of the filtrate is tested by estimating the amount of decinormal sulphuric acid necessary to neutralize it (phenolphthalein marking the reaction). It is desirable to bring the alkalinity approximately up to the strength recommended by Joulie as forming the most stable composition of calcium sucrate solution, namely, so that 1 c.c. of this solution corresponds to ·008 gram of sulphuric acid (H_2SO_4). This solution must be kept in a stoppered bottle, and only such a small quantity poured out from it as may be required for each day's testing, as it does not keep when exposed to the air.

The most convenient means of making the test is as follows : A small quantity, say 10 c.c., of the sucrate solution described above is poured into a graduated hand-burette. Twenty c.c. of the urine to be tested, *which must be absolutely clear*, are poured into a small beaker (capacity about 50 c.c.), and the operator holding this beaker in his right hand, pours with his left the sucrate solution, drop by drop, into the urine, which must be gently agitated the while by rotating the beaker ; it is well to have a black background and a strong upper light. A flocculent white precipitate forms with the addition of each fresh drop, disappearing with agitation until the end-point of the reaction is reached, indicated by a faint cloudiness which remains permanent. The number of c.c. of sucrate used is then read off and the following calculation made : If the sucrate solution has been standardized so that 1 c.c.= ·0082 gram sulphuric acid (H_2SO_4), and if 1·5 c.c. of sucrate have been added to 20 c.c. urine, then for 1 litre

the amount required will be ·0082 × 1·5 × 50 = 615, which will be noted as "Joulie-acidity per litre"—(J.A.). For a normal urine of sp. gr. 1,018 this is approximately ·849. It is to be noted that the "Joulie-acidity" in no way corresponds to the total acidity of the urine, as measured by decinormal sodium hydrate, with end-reaction marked by phenolphthalein; its chief value is that it estimates the *physiological* acidity, which is defined as the capacity to hold in solution the contained calcium phosphate.

The determination of Joulie-acidity per litre, without consideration of the density, does not allow of useful comparison of urines with different amounts of solids. To overcome this defect, Joulie has proposed a formula which expresses the ratio of the density to the acidity. If A be the acidity and E the excess of density over distilled water (with the usual temperature correction), then $\frac{A}{E}$ will represent this ratio. This ratio multiplied by 100 will express "the percentage in acidity of the excess of the density of the urine over water," and he calls this result $\frac{A \times 100}{E}$ the "Rapport acidité," or "R.A.," which is normally about 4·5.

The second important section of Joulie's work is his insistence on the relation of the excretion of phosphates to the acidity. It must be emphasized that his acidity-test is a measure of the monobasic acid sodium phosphate present, but as there are neutral phosphates eliminated as well, the estimation of the acidity does not give an indication of the total phosphates. The importance of determining the phosphatic equilibrium of the body becomes practically apparent when the therapeutic measures to be taken for hypo- and hyper-acidity are considered, for the administration of phosphorus-derivatives of phosphoric acid in the first, and of alkaline phosphates in the second case, is the most convenient method. The phosphates are regarded as the "mineral skeleton" of the living cell, and there is no criterion of metabolism more valuable than the knowledge of the state of phosphatic equilibrium.

A quantitative estimation of the total phosphoric acid (P_2O_5) passed in the urine forms, therefore, the complement of the acidity test. The estimation may be made in the usual way by the uranium nitrate method. To make comparison with urines of different densities, the same ratio is used as has been described above in the case of the estimation of the acidity; thus, if P equals the amount per litre of P_2O_5 present, $\frac{P \times 100}{E}$ = the ratio of phosphoric acid or "R.P." ("rapport phosphorique").

The normal value of this ratio is 11·17 in urines of a density of 1,018. When the amount in any given example is under this figure, there is "real or apparent hypophosphaturia"; when it exceeds this figure there is "real or apparent hyperphosphaturia." These expressions

are explained by a consideration of the third ratio, to which Joulie attaches prime importance, namely, the relation between the "Rapport acidité," R.A., and the "Rapport phosphorique," R.P. This is normally 2·45 $\left(\text{viz., } \frac{\text{R.P.}}{\text{R.A.}} = \frac{11{\cdot}17}{4{\cdot}55}\right)$, and is called the "acido-phosphoric ratio" (or "R.P.A." in the following estimations):—If R.P. is less than 11·17, but R.P.A. exceeds 2·45, there is *real* phosphaturia, though *apparent* hypophosphaturia, the non-acid phosphates forming the bulk of the excretion. If R.P. $<$ 11·17, there is hypophosphaturia, real or apparent. If R.P. $>$ 11·17, there is *phosphaturia*, real or apparent. The decision as to whether these findings are real or apparent is made by estimating the value of R.P.A. *Whenever this exceeds 2·45 there is real phosphaturia.* Thus, again, if R.P. $>$ 11·17, but R.P.A. $<$ 2·45, there is real hypophosphaturia, though apparent phosphaturia if the value of R.P. alone is considered. The apparent findings must in each case be checked by the ratio to the acid content. A number of important conclusions can be drawn from variations in these three ratios and their relation to each other, for the consideration of which one must refer the reader to Joulie's work.

A selection is given of those cases in which more than one investigation of the urine was made; where this is possible, it is well to have samples from consecutive days, as one thereby gets a more representative report of the patient's average function. It is necessary to insist upon the absolute cleanliness of cork and bottle in which the urine is sent. The specific gravity and the temperature of the urine being taken, the correction for temperature is made, tables for which are supplied in most urological text-books.

Results and Treatment.—Joulie's work was initiated by his own failure to respond to treatment prescribed by the eminent colleagues whom his position in Paris enabled him to consult. He was thought to be suffering from "acid dyspepsia," and dosed with alkaline bicarbonates, whereas he was really the victim of chronic hypo-acidity. Experiments, at first upon himself, convinced Joulie that the most convenient means of counteracting this hypo-acidity was by the administration of **Phosphoric Acid,** which he came ultimately to take in quantities far exceeding the pharmacopœial doses, with sustained benefit to the symptoms. The selection of a mineral acid was necessary, vegetable acids too readily undergoing oxidation and change; phosphoric acid was regarded as the least irritating stable acid. When diluted largely with water it does not coagulate albumin and is rapidly absorbed. The amount to be given will depend on the degree and duration of the hypo-acidity, and should be checked by repeated examination of the urine during the course of treatment, with the object of fixing the dose at such a quantity as will keep the physiological "rapport acidité" at approximately the normal figure, 4·5. It is best given with meals, and in small doses to begin with. The maximum daily dose which may be considered safe is given by Joulie as a quantity of the official acid which may be estimated as containing 4 grams of

phosphoric anhydride (P_2O_5). He himself took more than double this dose, and while taking this found his urine of normal "physiological acidity," and his general symptoms satisfactorily affected.

Hyper-acidity is much less frequent than hypo-acidity, and much more easily remedied. The best immediate medicinal means of relief is by an alkali which saturates the free acid with a minimum of gaseous formation, and which becomes inert when saturation is complete. **Prepared Chalk** is the most convenient of these antacids, and is to be preferred to bicarbonate of soda; if constipation should be produced by it, **Magnesium Carbonate** may be substituted, or **Magnesium Hydrate.** Though relief of hyperacidity may thus be obtained by these antacids, the cure lies in general treatment, of which the chief factor is diet. The quantity of fluid taken in the twenty-four hours is frequently too small, especially in sedentary, town-dwelling folk; the most reliable and valuable guide to this defect is the increased density of the morning water; if this is kept at a density of between 1015 and 1020 the fluid taken is probably sufficient. The addition of alcohol to the diet increases the insolubility of the urates, the deposit of which in the tissues is the most formidable effect of hyperacidity. The best adjuvant of water in dissolving urates is **Phosphate of Soda.** The urine of hyperacid patients shows usually a decreased output of phosphates, following upon phosphaturia, and as it is important to supply phosphates to the tissues, the indication for giving sodium phosphate is found, especially, in the fact of hyperacidity, coupled with a "phosphoric acid ratio" (R.P.) below 11·17. The best time to give this medicament is in the morning, half an hour before food, in doses of one drachm, dissolved in distilled water. In these quantities it is not purgative. If the hyper-acidity continues after this treatment, the **Stronger Alkalies,** such as citrates, tartrates, and acetates of soda and potash, may be given, all of which become transformed into alkaline carbonates in the blood.

Diastatic Ferments in Urine.—Rosenthal[2] finds that a healthy man excretes a urine whose diastatic power varies at different periods of the day, but that the total urine of twenty-four hours has a constant diastatic ferment action. Marino[3] finds that in *diabetes mellitus* and in *nephritis* the excretion of diastase is very much diminished. Wynhausen[4] finds that the diastase content of the urine enables one to distinguish the severity of a given case of diabetes mellitus; in the mild forms of the disease the content is high, but when the ferment is diminished or absent the case is severe. In certain conditions it is claimed that the *permeability of the kidney* can be estimated by the diastase excretion with as great certainty as by any other method. Decrease in the permeability of the kidney, such as occurs in certain forms of nephritis, is shown by a diastase decrease in the excretion; an increase in the permeability of the kidney, as seen in acute infectious disease, can cause an increase of the ferment excretion.

Hæmatoporphyrinuria. — Dana[5] contributes the details of a case which is of considerable importance in relation to the etiology of

this condition. The clinical history would indicate that the patient suffered from an incomplete cerebral thrombosis involving probably the left frontal lobe. The psychical symptoms were, however, of the confusional and toxic type. The study of the blood and urine show that the hæmatoporphyrin was not the result of a breaking up of blood cells either living or from a brain clot, for there would then have been some hæmatin or iron-bearing product. The author concludes that perhaps the hæmatoporphyrin in drug cases is due to some pathological disturbance of hepatic metabolism, and not to hæmolysis, as has been usually supposed. This view is supported by the fact that in hæmatoporphyrinuria due to drugs the liver cells show fatty degeneration.

Monro[6] points out that there are: (1) Cases in which an excess of hæmatoporphyrin and a pigment giving an abnormal colour to the urine are both present; (2) Cases where an excess of hæmatoporphyrin is present without the unusual pigment. This being so it is reasonable to expect that (3) Cases will be met with where the abnormal pigment is present in the urine and yet without excess of hæmatoporphyrin. Such a case is recorded; that of a young woman who, within a few days of her first confinement, and taking no drugs, on two occasions passed urine of a bright red colour, quite transparent and containing no sediment. On extraction the urine gave no spectrum of hæmatoporphyrin, but by exclusion it was proved to contain the unidentified pigment not infrequently met with in hæmatoporphyrinuria.

Oxaluria.—Man usually excretes daily 20 mgrams of oxalic acid. This excretion is independent of the amount of oxalic acid in the food. A large part of the oxalic acid taken with the food is oxidized by the action of the bacteria of the alimentary canal. Serkowski and Mozdzenski[7] consider it impossible to diagnose *oxaluria* or the deficiency of oxalic acid excretion from the mere investigation of the urinary sediment, because the value of the sediment and of the filtered urine very often disagree. A large number of observations show that the quantity of oxalic acid stands in no relation to the quantity of indican, and they fail to find any relationship between oxalic acid and uric acid excretion. Microscopic investigation shows, as has long been known, that though oxalic acid may be present in the urine in increased proportion, precipitation of the salt may not take place.

Uric Acid.—Aufrecht[8] describes a simple method for the estimation of uric acid in the urine, serous fluids, and blood, for which he claims accuracy. The urine is concentrated by evaporation, treated with a saturated solution of ammonium chloride, and the ammonium urate separated by means of the centrifuge and estimated by titration with permanganate. 25 c.c. urine is evaporated to about one-fifth of its original volume. The resulting fluid is placed in a cylindrical, round-bottomed centrifuge tube (which is specially made for the purpose) and distilled water added to mark U; the ammonium chloride solution (35–100) to mark R. When cool it is centrifuged for from three to five minutes. The clear fluid is poured

off, and the precipitate moistened with 5 c.c. ammonium sulphate solution, and again centrifuged. The clear fluid is then poured off and ammonium sulphate solution again added. Again centrifuged. The washing is repeated in order to get precipitate entirely chloride-free. The precipitate, which consists of ammonium urate, is dissolved in 10 c.c. 1 per cent sodium carbonate solution. The solution is poured into a beaker, the tube washed, and the washings added. The solution is acidulated with 5 c.c. concentrated sulphuric acid, heated to boiling, and quickly titrated with 1 per cent permanganate solution till it colours red. Every cubic centimetre of the potassium permanganate solution corresponds to 0·74 mgrams uric acid. The whole manipulation takes about an hour. If the urine contains albumin, this should be removed by heat. In dealing with fluid exudates or blood, the procedure is similar.

Uric Acid Excretion. — Labbé and E. Furet[9] have studied the influence of alimentation on uric acid excretion. The laws which govern the excretion of uric acid in healthy individuals do not apply to the excretion under pathological conditions. The relationship between the ingestion of nucleo-proteins and the purin excretion still exists, it is true, but so modified by the retention of purin bodies that one cannot recognize it. The influence of the pathological process quite overshadows the influence of diet. The excretion in a number of diseased conditions was studied, but diet tests gave very inconstant results. In cases of diabetes and in obesity there was found marked purin retention; under increased ingestion of nucleo-protein, uric acid excretion was not augmented, or only augmented in an insufficient or delayed manner. A carefully regulated lacto-vegetable diet in such cases not only hindered the progressive accumulation of uric acid, but also favoured the elimination of previously retained uric acid. It is in gouty individuals that the difficulties of uric acid metabolism are most pronounced. All human organisms are disposed to retain uric acid if it is ingested in excess. Every man, therefore, is predisposed to gout, and food too rich in nucleo-proteins converts this predisposition into an active pathological process.

References.—[1]*Pract.* 1911, ii, 43; [2]*Deut. med. Woch.* 1911, 923; [3]*Deut. Arch. f. klin. Med.* ciii, 325; [4]*Berl. klin. Woch.* 1910, 2107; [5]*Amer. Jour. Med. Sci.* 1911, 247; [6]*Quart. Jour. Med.* 1910, 33; [7]*Zeits. f. phys. Chem.* lxx. Pts. 4 and 5; [8]*Berl. klin. Woch.* 1911, 627; [9]*Rev. de Méd.* 1911, 177.

URINE TESTS. *O. C. Gruner, M.D.*

Cammidge Test.—An experimental research by Whipple, Chaffée, and Fisher[1] gives extensive information as to the value of this test. They show that a negative reaction is not against pancreatitis, since in dogs with experimentally produced pancreatitis it may be consistently absent. On the other hand, a positive reaction is not infrequent, both in normal dogs and normal man, and is almost always obtained in the case of dogs poisoned by chloroform or dying of pneumonia. They conclude that the two last conditions are probably explicable by the occurrence of active autolysis in the body, because in the case of

chloroform poisoning the liver is found to be extensively necrosed, and in the case of pneumonia active destruction of the cells is well known. Furthermore, the introduction of hydrolytic cleavage-products into the peritoneum readily and regularly produced a positive Cammidge reaction. They used for the purpose lung tissue and thymus, boiling them for some hours with a dilute acid, neutralizing, filtering, and concentrating. Chronic pancreatitis was induced in dogs by injecting bile into the pancreatic duct The clinical symptoms were typical, and the microscopic examination showed well-marked changes, and yet a negative result was obtained. On the other hand, cases of chloroform poisoning gave a striking positive reaction, though they showed no microscopic change in the pancreas post mortem. The changes were those of autolysis in the liver.

The perusal of this careful work leads to the conclusion that the crystals obtained by the reaction vary to an amazing degree, some being insoluble and others readily soluble in acid, so that observers of different mental attitude would regard the reactions as positive or negative in any given case. Indeed, the same specimen presented to several observers was reported on differently by them. The facts that the solubility depends on the delicacy of the crystals and the variations in the salt content of the fluid, and, above all, that variations of melting-points from 140° to 180° occur (even on repeated crystallization), tend to the conclusion that the test is not of any scientific value. The authors who are being quoted could not confirm Cammidge's contention that the crystals melted sharply at 178° or 180° C.

Another contribution to the same subject by Kinney,[2] at the German Hospital of Philadelphia, bears out these conclusions to a certain extent, though the writer is more disposed to consider the reaction of value in certain cases. Nevertheless, he admits that a negative result may obtain in pancreatitis, and a positive in cases which are not pancreatitis. He concludes that if the history, physical examination, and examination of the fæces indicate pancreatic lesions, a positive "C" reaction is of value as confirmatory. Here again it is very important to note that the diagnosis of chronic pancreatitis was made by inspection and palpation of the pancreas at operation, whereas it is quite certain that pancreas apparently pathological on inspection, may be perfectly normal histologically.

Boos and Harmer[3] do not dispute that the reaction occurs in cases with pancreatic involvement, but have found it in a variety of other conditions as well.

William Russell,[4] who has also subjected the test to an extensive trial, states his opinion of it thus: "From these results it is seen that a positive Cammidge reaction may be obtained from the urine of persons in good health; that it may be obtained from the urine of persons suffering from a great variety of abdominal disorder or disease; that it may be present in other diseased conditions; that it may be present when autopsy shows that the pancreas is not the seat of any

anatomical change. All this to the physician and to the pathologist definitely excludes pancreatitis as the cause of the Cammidge reaction."

Finally, Sorrentino,[5] who has examined the urine of thirty healthy individuals, obtained a positive reaction to the test in all of them! He naturally concludes that the test is valueless as an indication of pancreatic disease.

The Detection of Salvarsan in Urine.—Abelin[6] gives as a method for detecting salvarsan in the urine, the following colour reaction. Into one test tube put some urine to which dilute nitric acid has been added, using half as many drops of the acid as there are c.c. of urine employed; then add 3 drops of a ½ per cent solution of sodium nitrite. Into another test tube place an alkaline solution of resorcin. This is made by dissolving 3 grams in 3 c.c. of water and adding an equal volume of 20 per cent sodium carbonate. By means of a glass rod take a drop from the first test tube and stroke it on iodide of starch paper. A dark spot should appear and remain present for at least a minute. If this reaction does not occur, it will be necessary to add another drop or two of the nitrite. The contents of the first test tube are now added to those of the second, drop by drop. If salvarsan be present, the resorcin will turn red. This test is sensitive to 1–100,000 parts.

Free mineral acid hinders the reaction. The solution must be fresh and pure.

The reaction depends on the diazotizing of the salvarsan by means of nitrous acid, in the same way as a simple primary amine can be diazotized; consequently a reaction will take place with phenols and phenol-sulphonates, with the production of a colour.

Albumose Test.—Albumoses can be found in the urine by the following test published by Fittipaldi.[7] A small quantity of urine is treated with six times its bulk of absolute alcohol. The alcohol is poured off next day and the precipitate dissolved in a small quantity of soda. On treating the solution with a freshly made ammoniacal solution of a nickel salt, a reddish orange colour is produced if albumoses or peptones are present.

References.—[1]*Johns Hopkins Hosp. Bull.* 1911, 339; [2]*Amer. Jour. Med. Sci.* 1911, i, 878; [3]*Boston Med. and Surg. Jour.* 1910, June 16; [4]*Brit. Med. Jour.* 1910, July 2; [5]*Brit. Med. Jour.* 1910, July 9; [6]*Münch. Med. Woch.*, 1911, 1771; [7]*Deut. Med. Woch.*, 1911, No. 41.

URTICARIA.

(*Vol.* 1910, *p.* 17)—The exhibition of **Calcium Lactate** often helps to shorten attacks.

UTERUS, DISEASES OF.

Victor Bonney, M.S., M.D., B.Sc., F.R.C.S.

Abdominal Myomectomy. — W. Mayo[1] strongly advocates myomectomy for fibroids in women between twenty and thirty years of age. The mortality of the operation for the last ten years has been only one in 157 consecutive cases. All dead spaces must be obliterated by sutures of catgut, which must be tied just tight enough to

coapt the tissues and stop hæmorrhage, without blanching them. Twice in the series of cases, small tumours were missed, which necessitated a second operation. This is an undoubted drawback to its practice. However, the advisability of avoiding hysterectomy in a young woman wherever possible is undoubted, and the operative mortality in selected cases is nowadays very low.

Utriculoplasty.—Victor Bonney[2] has reported six cases of uterine hæmorrhage treated by "utriculoplasty." This operation consists of excising a wedge-shaped area of the whole thickness of the uterine wall, having its base at the fundus and its apex just above the internal os, the two moieties of the organ being then sutured together. A large proportion of the corporeal endometrium is thus removed and the "menstrual area" correspondingly diminished, so that a utriculus or miniature uterus is formed. The operation is indicated chiefly in cases of intractable bleeding from a uterus slightly or not at all enlarged and the seat of "fibrosis"; but it is also applicable to cases of small multiple myomata.

The results of the operation have been very good, all the patients having been relieved of the hæmorrhage from which they suffered. The first case became pregnant four months after the operation, but in spite of the small size of the uterus the gestation proceeded normally till seven and a half months, when premature labour came on and the patient delivered herself naturally. She has been examined from time to time since, and the uterus has retracted back to the "utriculus." The author discusses the value of the operation as compared with hysterectomy, by which all the six cases might have been alternatively treated. The risk should be no greater or less than that of the more radical operation. In regard to the maintenance of the menstrual function, this is not of great importance in older women, but is worth trying for in the young, and especially where the woman objects to the idea of an enforced stoppage of the menses. To be able to leave a uterus functional for child-bearing is, however, a great gain, which more than balances the more positive assurance of cure that removal of the whole uterus gives.

[*Note.*—Since this article was written, one of the patients therein referred to has had to have her uterus removed on account of recurrence of the hæmorrhage.—V.B.].

Retroversion and Prolapse of the Uterus.—An interesting "symposium" on the subject of the treatment of retroversion and prolapse of the uterus took place at the American Medical Association last year.[3] The authors of a number of methods of securing rectification by operations on the round ligaments described their technique in detail. Baldry draws a loop of the round ligament of either side through a hole in the corresponding broad ligament and fastens them together behind the back of the uterus, to which they are also attached by separate sutures. Gilliam pulls a loop of the round ligament on either side through small apertures in the abdominal wall about one inch to the side of the central incision which has opened the peritoneal

cavity. The loops are then sutured in this position. Coffey attains his object in a different manner. Each round ligament is plicated against the front of the uterine body by sutures, and the peritoneum covering the front surfaces of the broad ligaments is then pulled inwards and sewn over them.

Simpson performs an ingenious operation of which the steps are as follows: The abdomen having been opened by a median incision, the round ligament on either side is picked up with a forceps about an inch and a half from the uterus. A small opening having been made through the fascia over the rectus, a curved forceps is passed through it outwards under the abdominal aponeurosis as far as the internal abdominal ring. At this point the blades of the forceps are retroperitoneal and can be seen through the abdominal incision. By elevating the handles of the forceps toward that side, the blades are now made to turn in towards the middle line under the peritoneum, covering the front of the broad ligament and parallel to the round ligament. When the point of the forceps is about an inch and a half from the uterus, it is pushed through the peritoneum, and the round ligament is seized and drawn back in the path previously made by the forceps. The knuckle of round ligament thus drawn into the abdominal wall is fastened by sutures to the fascia at the point where the forceps were originally introduced. The same proceeding is then carried out on the opposite side, and the abdominal wound is closed.

A perusal of these papers is interesting. Naturally each originator lauds his own operation. An unbiassed consideration, however, seems to show that there are several methods of correcting retrodisplacements of the uterus, all of which are satisfactory when properly carried out. The operation designed by Simpson I have personal knowledge of, having habitually employed it for these cases for some years. It is certainly one of the best of all these procedures. In America, direct fixation of the uterus to the abdominal wall, both for retroversion and prolapse, seems to have been practically abandoned. In this country, on the other hand, it is still largely practised with excellent results in either condition.

Inasmuch, however, as direct fixation to the abdominal wall has theoretical disadvantages from the point of view of anatomy, while the same results can be obtained in retroversion by operations on the round ligament, I believe that the latter should be preferred. In prolapse, on the other side, there are certain definite advantages to be obtained by direct fixation, for in that condition not only is it necessary to rectify the retroversion of the uterus that always co-exists, but it is desirable to make use of the organ as an artificial ligament to pull up the vaginal vault and pelvic floor. In this latter effect, shortening of the round ligaments fails, because it does not exercise a sufficiently direct upward pull on the uterus. In prolapse, therefore, better results are obtained by ventrofixing the uterus, conjoined with a plastic operation to readjust the relaxed condition of the vaginal walls and outlet.

Cæsarean Section after Ventrofixation.—In connection with the above remarks, a short communication by Routh[4] is of much interest. This author recently collected 1282 cases of Cæsarean section, and out of these there were eight in which the operation was necessitated by previous ventrofixation. Seeing that during the period covered by Routh's cases probably 1000 ventrofixation operations have been done in Great Britain, it is seen that the frequency with which that operation is followed by obstruction in labour is inconsiderable. On the other hand, there are on record a very large number of instances in which the operation in no way interfered with subsequent pregnancy and labour. There are several ways of ventrofixing the uterus, and it is in those in which the posterior uterine wall has been used for the attachment, or in which the attachment has been made unnecessarily extensive and strong, that difficulty in labour is prone to follow.

Intra-uterine Medication.—Dudley[5] has lately practised a novel method of intra-uterine medication. To the end of a tupelo tent is attached a gelatin capsule filled with the substance to be introduced. The uterine secretions dissolve the capsule and set free the contained chemical, which, because its escape from the uterus is prevented by the presence of the tent in the cervix, necessarily exercises its effect on the endometrium in a very thorough manner. Dudley uses a mixture of one-third **Iodine** and two-thirds **Iodide of Potassium** in the capsules. Three or four grains of the mixture is the usual dose. He lays great stress on the necessity for strict asepsis. The tents are sterilized by exposing them to a dry heat of 240° F. on two successive days, and again before using. They may be introduced without a general anæsthetic if a 10 per cent cocaine solution be applied for ten minutes to the uterine cavity by means of a probe wrapped with absorbent cotton. If the cervical canal be too narrow to allow of the introduction of the tent, it may first be slightly enlarged by mechanical dilatation.

Dudley makes no special claim for the method, as he himself has only used it for a few months, but he has so far found it satisfactory. It certainly seems a legitimate method of treating troublesome cases of uterine discharge, especially those of gonococcal origin, in which thorough curettage has failed to effect a cure.

For **Pituitary Extract** in hæmorrhage, subinvolution, etc., see *page* 34 ; Bordier's method of **X-ray** treatment of fibroids is summarized on *page* 76 ; and S. Leduc advocates **Ionization** on *page* 97.

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VACCINATION.

E. W. Goodall, M.D.

Sigmund Wassermann (Cleveland, U.S.A.), recommends for performing vaccination the scarifier devised by von Pirquet for his cutaneous tuberculin test. It is a small chisel, with the sharpened edge of which the drilling of the skin is so free from pain as hardly to be perceptible

by children. He claims that by the use of this instrument one can very accurately determine the extent of trauma, and therefore of the resulting lesion. He states that the rotating movement of the instrument should be carried on till a "reddish, urticarial papule with a central depression" is formed, the lymph having previously been expelled from the capillary tube on to the skin, properly cleansed, at the desired point. It is quite unnecessary to draw blood in the process of scarification. In this method of vaccination the development of the local lesion is mild and slow; "the reactive congestion is small and keeps within the nearest bounds of the pustule; neither does a bacterial infection take place readily."

Reference.—[1] *Jour. Amer. Med. Assoc.* 1910, Sept. 17.

VACCINIA.

Experiments with **Salvarsan** (*page* 56).

VAGINA, DISEASES OF. *Victor Bonney, M.S., M.D., B.Sc., F.R.C.S.*

Adenomatosis Vaginæ.—Victor Bonney and Glendinning[1] describe a hitherto unrecognized condition under this name.

The patient was a middle-aged multipara who had had a continuous clear and viscid discharge for twelve years. The vaginal surface was red, granular, and "honeycombed," and bore numerous small sessile cysts.

Histology.—The surface epithelium was much reduced in thickness, whilst the tissues beneath it were deeply permeated by many racemose glands lined by a single layer of columnar epithelium actively muciniferous, and opening out here and there on the surface of the short ducts. A diffuse adenomatous condition of the whole vaginal wall was therefore present.

Etiology.—The production of the condition depends, according to Bonney and Glendinning, upon (1) a congenital defect whereby the normal metamorphosis of the columnar Müllerian epithelium into stratified epithelium has been imperfectly consummated; and (2) an acquired stimulus in later life, probably inflammatory, whereby the glands already existing had been provoked to great proliferation.

No Treatment was carried out, because beyond the discomfort of the constant discharge the patient was not incommoded. The case subsequently reported by Haultain,[2] however, shows that such an abnormal state of the vaginal epithelium is a menace of carcinoma. This patient, under observation for fourteen years with a condition identical with that first described and quite resistant to astringents and curettage, returned complaining of much smarting in the vagina and frequency of micturition. The vaginal wall was thickened and warty. Microscopical investigation now showed a diffuse columnar carcinoma, of which she subsequently died. Haultain remarks that should another such come under his care he would, in view of his experience, recommend excision of the vagina. [With this I agree. —V. B.]

Berry Hart[3] discussed Haultain's case from the embryological point of view. A fact bearing on this interesting disease has also been noted by Blair Bell,[4] who, examining the nature of the obstructing membrane in cases of so-called "imperforate hymen," found its inner surface in one case lined by a columnar epithelium bearing glands similar in all respects to those found in the two reported cases of adenomatosis vaginæ.

Hæmatocolpos and the Characteristics of Menstrual Blood.—Blair Bell[5] has published a very interesting paper on the nature of the fluids retained in the vagina in cases of so-called "imperforate hymen." The work of several investigators has established the fact that in such cases it is not the hymen that is imperforate, that structure being found stretched over the occluding membrane but itself patent. The membrane represents a failure on the part of the fused lower ends of the Mullerian ducts to reach the surface of the urogenital sinus. The retained fluid consists of blood and mucus, the latter varying in proportion from about 80 to 33 per cent of the total. The menstrual blood differs from normal blood in two very important particulars. In the first place, it contains neither fibrin ferment nor fibrinogen, and hence is non-coagulable. In the second, it contains a great excess of calcium salts. Similar results have been obtained as regards the absence of fibrin ferment and fibrinogen by Cristal and Denk.[6] The normal non-coagulability of menstrual blood is attributed by Blair Bell to a specific action of the corporeal endometrium, whereby the fibrin ferment and fibrinogen are held back by a process of selection. It therefore follows that in all conditions in which clots are passed during menstruation this process is in abeyance, i.e., there is something amiss with the endometrium.

Another interesting point brought forward by the author was the presence of a considerable quantity of lactic acid. The occurrence of this substance in the vagina was attributed by Döderlein to the so-called "vagina bacillus." In cases of hæmatocolpos, however, the vaginal contents are sterile, so that this explanation fails. Blair Bell suggests its formation from mucin by enzymes.

Sarcoma Vaginæ.—The subject of vaginal sarcoma has been studied by McFarland,[7] who collected 101 cases from literature. The disease is a rare one, but very fatal. It occurs at all ages, but is commonest in the first, fourth, and sixth decades. A peculiar type known as grape-like sarcoma occurs in children, nearly a third of the reported cases being of this variety. The tumour first attracts attention either by projecting through the vaginal orifice or by giving rise to bleeding. It presents as a number of rounded papillary excrescences. It attains a large size, filling the pelvis and invading the bladder, but metastatic growths are unknown. The sarcomas of adult life embrace all the known histological varieties.

A perusal of McFarland's tables shows that the outlook in any case of vaginal sarcoma is very bad, and is especially so in the grape-like form of infants. Out of 32 such cases only one was reported alive

three years after operation. It therefore appears that in the event of a case being suitable for surgical measures, the most extensive operation feasible should be performed.

REFERENCES.—[1]*Proc. Roy. Soc. Med.* iv, Pt. 1; [2]*Edin. Med. Jour.* 1911, June; [3]*Ibid*; [4]*Lancet*, 1911, May 13; [5]*Ibid*; [6]*Wien. klin. Woch.* 1910, 234; [7]*Amer. Jour. Med. Sci.* Ap. 1911.

VARICOSE VEINS. *Priestley Leech, M.D., F.R.C.S.*

Mitchell[1] recommends the following operation. An incision one to one and a half inches long is made transversely just below the saphenous opening. The internal saphenous vein is found, clamped between two forceps, and divided; the upper end is ligatured with iodine catgut. By pulling on the forceps attached to the distal end of the vein, the line of the vessel beneath the skin is easily located by the index finger of the other hand. Another incision is then made four or five inches down the thigh, according to the strength of the vein, etc. The vein is here again picked up, clamped, and carefully freed from connective tissue. By drawing alternately first on the upper and then on the lower pair of artery forceps, the vein is made to run freely up and down under the skin. The upper forceps is then removed and the intervening portion of vein slowly pulled out. Care must be taken not to twist it, otherwise it is very apt to break off. The loose portion is now cut off, and the process repeated until the knee is reached. Below the knee the process is continued, but the incisions are much closer together; also several incisions are made and numerous pairs of forceps are applied before any attempt is made to extract the segments of vein. Should a vein break, the segment must not be left, but a fresh incision be made and the piece extracted: if such pieces are left they almost invariably become the seat of thrombosis and require subsequent removal.

REFERENCE.—[1]*Edin. Med. Jour.* 1911, ii, 58.

VENEREAL PROPHYLAXIS. *C. F. Marshall, M.D.*

Ledbetter[1] reports the results of venereal prophylaxis as carried out in the United States Navy. All men who have exposed themselves to the risk of venereal infection have to report to the medical officer on returning to their ship. The *method* of prophylaxis is as follows: The entire penis is scrubbed with liquid **Soap and Water** for several minutes, and then washed with **Perchloride of Mercury** solution, 1–2000. If any abrasions are present, these are sprayed with **Peroxide of Hydrogen.** Two urethral injections of **Argyrol** (10 per cent) are then given and retained for five minutes. The whole penis is then rubbed with 33 per cent **Calomel** ointment, which is kept on for several hours. It is stated that these measures have greatly reduced the percentage of venereal disease in the service, and that if the men report for treatment within twelve hours after contact the danger of infection is "practically *nil*." Argyrol is preferred to protargol for injection as being much less irritating.

REFERENCE.—[1]*Jour. Amer. Med. Assoc.* 1911, Ap. 15.

VINCENT'S ANGINA.

Salvarsan effective (*page* 56).

VOMITING IN INFANTS. *G. F. Still, M.D., F.R.C.P.*

In association with Diarrhœa. (*See* DIARRHŒA.)

Chronic, with Distention of Stomach. (*See* PYLORUS, CONGENITAL HYPERTROPHY OF.)

Cyclic Vomiting.—This subject has attracted much attention in recent years. Described originally by Dr. Gee under the name of "recurrent or fitful vomiting in children," it has also been described as "cyclic vomiting," and since the discovery that acetone is often present in considerable quantity in the urine in these cases, the name "acetonæmia" has been used. Finally, those who think that some acid intoxication underlies the condition now call it "acidosis."

SYMPTOMS.—Sharp[1] says that on entering the bedroom one notices the peculiar sweet odour of the breath suggestive of diabetes. There is drowsiness or semi-coma in many cases. The vomiting is severe in the sense that everything is rejected, but the amount vomited at a time is often not more than a mouthful of clear fluid. Headache is a frequent symptom, and there is also marked thirst, but no appetite. Respiration is quick, the skin is hot and dry, but the temperature at first is usually not above 99° F., though at a later stage it may rise as high as 103° F. The bowels are, as a rule, costive, and the urine is scanty, containing acetone and sometimes diacetic acid. In mild cases the urgent symptoms last not more than forty-eight hours. In the more severe ones the duration is longer, and the drowsiness more marked, merging in fatal cases into deep coma with high fever and convulsions. In many cases there is some tenderness in the epigastrium or in the hypochondrium.

McCaw[2] reports a case in which the respiration was like that in asthma, and others in which the respiratory organs were much affected. He points out that in such there was less vomiting than in others where there was little respiratory affection.

Hutchison[3] states that air hunger is rare in cases of ordinary cyclic vomiting, and in his opinion there are several different conditions grouped together under this title.

ETIOLOGY.—Mellanby[4] describes the current views of the causation of this disorder. It is attributed generally to an acid intoxication; but as to the production of the acid there is a difference of opinion. Langmead has suggested that some poison is absorbed into the portal circulation and acts upon the liver, causing a fatty infiltration of that organ, with subsequent acid poisoning. Howland and Richards, however, emphasize the nervous instability of the children in whom this affection occurs, and consider that shock or excitement may disturb metabolism, causing diminished power of oxidation, with the resulting presence of poisonous unoxidized substances in the blood. Ewing holds that defective function of the liver with failure of fat oxidization is the primary cause of the trouble. The general opinion

seems to be that the chemical fault underlying the acidosis is deficient oxidation of fat, with resulting accumulation of oxybutyric acid and aceto-acetic acid in the blood and tissues.

Garrod[5] states that the view which has sometimes been held that carbohydrate starvation is the cause of the acetonæmia cannot be accepted. Certainly, in some cases where the analogous condition of delayed chloroform poisoning occurs, there has been no antecedent carbohydrate starvation. There are those who regard the condition as having a much more tangible cause in disease of the appendix. Comby refers to eight patients who were cured by appendicectomy. Russell describes a case in which recurrent vomiting was found post mortem to be associated with some thickening of the pylorus, and suggests that a recurrent pyloric spasm may be the explanation of the disorder in some cases. Mellanby (loc. cit.) finds that creatinuria is present in all cases of acetonuria, and, as absence of carbohydrate from the diet or inability to utilize carbohydrate (e.g., in diabetes) produces excretion of creatin, suggests that acidosis in these cases is dependent upon deficiency of carbohydrate leading to some abnormality in the catabolism of fatty acids.

TREATMENT.—Sharp (loc. cit.) recommends as preliminary treatment a saline purge, consisting of

℞	Mag. Carb.	gr. xxxvi	Glycerini		℥ij
	Sod. Bicarb.	gr. xxiv	Aq. Menth. Pip.	ad	℥iij
	Pulv. Tragacanth.	gr. iij			

Two teaspoonfuls every one or two hours, with or without plain water or aerated soda-water.

In order to administer as much **Alkali** as possible, he gives 10 gr. of **Sod. Bicarb.** in a tumblerful of aerated soda-water. Incidentally he mentions that the child does not always appreciate this treatment, which he thinks may be improved by adding a tablespoonful of milk to the tumbler full. Should the child refuse this, he has recourse to cold water. If the vomiting becomes so persistent that the child gets no rest, he recommends a mixture of

℞	Tinct. Opii	℥j	Glycerini		℥x
	Tinct. Card. Co·	℥x	Aq.	ad	℥j

To be given every hour until the child gets sleep or rest.

Mellanby (loc. cit.) refers to the value of **Glucose,** on the assumption that one of the most important factors in producing the severe symptoms of acidosis is the absence of glycogen in the liver cells. He considers that the administration of large quantities of glucose is likely to be of more value than the administration of alkalies. This drug may be given by rectum if it cannot be retained by mouth.

REFERENCES.—[1]*Brit. Jour. Child. Dis.* 1910, 440; [2]*Brit. Med. Jour.* 1910, ii, 1137; [3]*Lancet,* 1911, i, 8; [4]*Brit. Med. Jour.* 1910, ii, 1139.

VOMITING OF PREGNANCY.

(*Vol.* 1910, *p.* 44)—**Validol** (menthol valerianate) may be useful, administered by the mouth in frequent doses.

VULVITIS, LEUKOPLAKIC.

(*Vol.* 1911, *p.* 692)—Cases have been successfully treated by **Ionization** with **Zinc** and **Mercury.**

WARTS. *E. Graham Little, M.D., F.R.C.P.*

Probably **Radium** and **X-ray** treatment are the most efficacious means of getting rid of these troublesome lesions, which are usually too numerous to be treated piecemeal. Le Pontoi[1] gives **Calcined Magnesia** or **Sulphate of Magnesia** in doses of 8 to 12 gr., and a large tumblerful of milk and lime-water. For local application the following are useful:—

R	Hyd. Subchlor. Acid. Salicyl. Resorcini	āā gr. xxiv	Adipis Lanæ	ʒj

Ft. ungt.

R	Acid. Acet. Glac. Sulph. Præcip.	part. j part. ij	Glycerini	part. iij

Ft. pigmentum.

[Where the lesions are not too numerous, I believe personally that freezing by **Carbon Dioxide Snow** or **Ionization** with magnesium or zinc ions is the best method of treatment.—E. G. L.] (*See also page* 96.)

REFERENCE.—[1]Quoted in *Pract.* 1911, 264.

WOUNDS, GUNSHOT. *Priestley Leech, M.D., F.R.C.S.*

The treatment of gunshot wounds is more in the province of the military surgeon, but the civil surgeon may be called upon to deal with them, and incorrect and unskilful treatment may have serious results. Berry[1] has had under his notice about a hundred cases of gunshot wounds; his advice on this topic is therefore worthy of consideration.

PRIMARY TREATMENT.—The first thing is to prevent contamination of the wound by covering it with an antiseptic dressing. Unless the patient is in hospital where every antiseptic precaution can be taken, it is far better to do nothing but this. Do not wash it, as by this means a quantity of dirty soap and water may be introduced into the wound. If the wound be small, no further treatment may be needed. If large, then nothing more should be done until the patient is in hospital. In rare cases hæmorrhage may occur from a large wounded artery; this may be treated temporarily by pressure, plugging the wound, or tourniquet. The next step is the transport of the patient. The utmost care should be exercised in these cases. A sharp splinter of bone may easily be driven into a neighbouring blood-vessel or

viscus. Internal hæmorrhage may be started or increased. Extravasation of the septic contents of a hollow viscus may be encouraged by injudicious or rough handling of the patient. If there is no indication for active surgical treatment, it is a good plan to leave the patient undisturbed for a time.

Secondary Treatment.—This should only be done under the most rigid antiseptic precautions. If the wound is large (as from a shot gun), and already contaminated as such wounds necessarily are, open widely and wash thoroughly with some antiseptic lotion, or simply pack with antiseptic gauze. (Peroxide of hydrogen is very good.—P. L.) Provision must be made for efficient drainage, and the gauze packing will have to be renewed as it becomes soaked with discharge from the wound,

Rifle or similar small wounds, as a rule need nothing but an antiseptic dressing. The exceptions are wounds of vessels or internal organs. However, before any interference is undertaken for removal of a bullet or for the treatment of a bullet wound, the surgeon should ask himself three questions: (1) "What harm has the bullet already done?" (2) "What harm will it do if allowed to remain where it is?" (3) "What harm shall I do if I attempt to remove the bullet or repair the damage already done by it?"

The harm done may be (*a*) a wound of vessels causing hæmorrhage, (*b*) sepsis from perforated viscera. If there is reason to believe there is a wound of the vessel and hæmorrhage is going on, the ordinary surgical rule of cutting down on the bleeding point and ligaturing on both sides of the wound must be followed. Wounds of the large vessels of the thorax are usually fatal. The main cause of sepsis in bullet wounds is perforation of infected cavities such as the intestine. In nearly all bullet wounds of the abdomen in which there is reason to fear that a hollow viscus has been injured, *if conditions permit of a large operation and if the patient is seen sufficiently early*, an exploratory operation should be undertaken, not to search for the bullet but to look for and close perforations in the hollow viscera (stomach, intestine, bladder). The lower the injury in the abdomen, the greater the chances of success. If for any reason operation under proper conditions is out of the question, then absolute starvation for a few days and a strict avoidance of purgatives, give the patient the only chance of life.

The harm done by the bullet depends on its situation. If buried in the tissues and unconnected with any septic viscus, a bullet will frequently become encysted and do no harm at all. If operation can be done without undue risk, the immediate removal of a bullet should be attempted when it is known to lie in close proximity to important structures, inflammation of which would involve great risk to life. Such structures are the brain, the spinal cord, the joints, the large blood-vessels, and various internal viscera and cavities. Reasonable accessibility and exact localization of the seat of the bullet are almost necessary conditions of attempted removal. Roving exploratory

operations in the absence of these two conditions are generally futile and harmful.

As a general rule, treatment of a bullet wound of the *brain* should be limited to the removal of depressed fragments of bone. Removal of the bullet should be attempted only if it is close to the surface, or if its position can be localized with the greatest accuracy and it seems probable that removal can be effected with a minimum of damage to surrounding brain tissue. A bullet which is known to lie in close proximity to the *spinal cord* should generally be removed as soon as possible, lest a fatal myelitis or meningitis should occur. Bullet wounds of *joints* demand immediate exploration for removal of the bullet and fragments of bone. A formal excision of a joint for a bullet wound is an operation that should probably never be performed. The use of the **X-rays** in localization is of the greatest importance, and it is better to wait than to undertake removal of a bullet without the information thus obtainable. From the point of view of the general practitioner, the practical point of most importance is the *immediate* **Antiseptic Treatment** of the external wound, not the question of removal of the bullet.

REFERENCE.—[1]*Pract.* 1911, ii, 278.

XANTHOMA; XANTHELASMA. *E. Graham Little, M.D., F.R.C.P.*

The common origin of these two diseases is usually assumed, incorrectly according to Pollitzer,[1] who regards the " eyelid " form (xanthelasma) as totally distinct from xanthoma, and the so-called xanthelasmic " cell " he produces evidence for ascribing to fatty degeneration of muscle fibres, which are richly distributed in the eyelid. His arguments may be summed up thus: (1) There is extremely little elevation of the tumour, because there is no new infiltration, but a replacement of the muscle fibre by the degenerative products; (2) They occur exclusively in the eyelids, where special muscles are present, and in the inner canthus, where these fibres are most numerous; (3) The yellow deposits are arranged in the lines of the muscle fibres; (4) Yellow pigment is an invariable accompaniment of muscles undergoing degeneration; (5) It appears at middle age, a time for degenerative processes to show themselves; (6) Normal muscle tissue disappears from areas where it should be found; (7) Microscopic structure of the tissue itself shows a transition from muscle cells to so-called " xanthelasmic cells."

REFERENCE.—[1]*Jour. Cutan. Dis.* 1910, 633.

YAWS. *Leonard Rogers, M.D., F.R.C.P.*

C. J. White and E. E. Tyzzer[1] record in detail a case of framboesia seen in Boston, in which the spirochæte was demonstrated. A monkey was successfully inoculated with the disease. The paper is well illustrated. A. B. Duprey[2] writes on yaws in Trinidad, and states that he is unconvinced by the recent work of Castellani and others. He sticks to his opinion that yaws is not a specific nor a contagious

disease, and believes that it occurs among underfed people and is predisposed to by eating green mangoes.

Salvarsan is said to be curative (*see page* 54).

REFERENCES.—[1]*Jour. of Cutan. Dis.* 1911, 138; [2]*Jour. of Trop. Med. and Hyg.* 1910, 372.

YELLOW FEVER. *Leonard Rogers, M.D., F.R.C.P.*

Rubert Boyce[1] records in detail the results of a historical study of the incidence of yellow fever in West Africa, together with personal inquiries into the medical records of the last few years, in a number of places. He maintains that the disease has been pretty constantly present in West Africa for the last hundred years, with no such large interval as to suggest its ever having died out during this period, while there is also no evidence to show that it has been frequently imported from the West Indies. It must therefore be endemic in West African colonies. The number of European inhabitants is not sufficient to account for the continued prevalence of the infection, so it must be kept up by infection of the native inhabitants, who suffer from a mild form of the disease, and by adult life become largely immune to yellow fever. An examination of medical case-books during the last ten years or so in several of the West African colonies, reveals a number of fevers diagnosed as "bilious remittent," etc., which in Boyce's opinion were really yellow fever, which had been wrongly diagnosed, medical officers being naturally loath to declare them to be yellow fever on account of the serious consequences which would result to trade interests. *Stegomyia*, the carrier of the infection of yellow fever, abounds in West Africa, while until very recently no efforts have been made to destroy them during the prevalence of the disease. The author of these papers admits the difficulties of making a diagnosis of yellow fever from the records contrary to the opinion of the medical men who had actually seen the cases, but he appears to have made out a case for further and more exact investigations to settle this important question. A melancholy interest is attached to this last publication of so eminent an authority on tropical diseases. W. J. Simpson[2] publishes an interesting report on yellow fever in Sierra Leone, written in 1870 by Staff-surgeon Albert A. Gore, which is of importance in connection with the above paper. Charles F. Craig,[3] in a paper on diseases due to a filterable virus, gives a good summary of the important American work which placed yellow fever in that class of infections. H. W. Thomas,[4] in a report on the sanitation and diseases in Manaos, North Brazil, advises that as a preventive measure against yellow fever, all fever cases should be reported at once and the patients screened to prevent infection of the mosquitoes. Otherwise the harm is done before the case is detected.

REFERENCES.—[1]*Brit. Med. Jour.* 1911, i, 181, 249, 301; [2]*Jour. Trop. Med. and Hyg.* 1910, 323; [3]*New York Med. Jour.* 1911, ii, 360.; [4]*Ann. Trop. Med.* 1910, 7.

ZAMBESI ULCER. *Leonard Rogers, M.D., F.R.C.P.*

W. J. Bruce[1] describes a sloughing form of ulcer met with in the Zambesi delta, usually situated below the knee and associated with a spirillum and a large fusiform bacillus. It attacks field workers, probably through scratches on the legs. The typical appearance is a single, shallow, punched-out, round or oval ulcer, with sloughy base. After five to fifteen days it granulates and slowly heals. [This description agrees with that of the so-called Naga sore in Assam, which I recently found to be very readily cured by cold compresses of a 1 per cent solution of **Permanganate of Potash.**—L. R.]

REFERENCE.—[1]*Jour. of Trop. Med. and Hyg.* 1911, Jan. 2.

Part III.—Miscellaneous.

PUBLIC HEALTH:

Including

I. MEDICO-LEGAL AND FORENSIC MEDICINE.

II. STATE MEDICINE (INCLUDING LEGAL DECISIONS).

III. INDUSTRIAL DISEASES AND TOXICOLOGY.

EDITED BY JOSEPH PRIESTLEY, B.A., M.D., D.P.H.,
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Followed by a Special Article on

THE NATIONAL INSURANCE ACT, 1911, AS IT AFFECTS THE MEDICAL PROFESSION.

BY H. WIPPELL GADD, F.C.S.,
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I. MEDICO-LEGAL AND FORENSIC MEDICINE.

THE CRIPPEN CASE.

The Crippen Case stands out as one of the most important trials for many years from the medico-legal point of view. Hawley Harvey Crippen was adjudged by the Lord Chief Justice to be guilty of the wilful murder of his wife, known as Belle Elmore. The points for decision were very definite, viz. :—

1. Were the "remains," which were found buried in the cellar of a house, those of a woman ?

2. If so, how long had such "remains" been buried ?

3. Were the "remains" found those of Belle Elmore ?

4. Were the "remains" in part the wall of the front lower abdominal region, marked with an old scar, the result of an ovariotomy ?

5. Was the primary cause of death poisoning by hyoscine ?

All these questions were satisfactorily answered as the result of the careful expert examinations and analyses, and the case is noteworthy on account of the precision and accuracy displayed in the Crown's evidence. This evidence may be grouped as follows, it being remembered that the crime was committed at the end of January, was not suspected until July, and was not proved until October :—

(*a*). *Evidence as to Sex.*

1. All the organs of a human body were found except those of generation, so that there was no anatomical proof of the sex.

2. A small piece of skin found was shown to be taken from the front wall of the abdomen between the umbilicus and the pubes, as proved by the presence of the aponeuroses, attachment of tendon, and a few curled uncut hairs attached to the skin (i.e., pubic hairs).

3. The piece of skin was marked with an irregular vertical line, varying in width from $\frac{1}{4}$ inch at the top to $\frac{1}{8}$ inch at the bottom, and showing, on microscopical examination, a complete absence of sebaceous glands and hair follicles, except in a small portion of epidermis, which appeared to have got tucked in and enclosed in the line—proving that the line was the remains of an old scar of an operation requiring a vertical incision through the abdominal walls between the umbilicus and the pubes, i.e., ovariotomy, having regard to the varying width of the scar, together with a small portion of epidermis caught in during the process of healing and contraction.

(*b*). *Evidence as to Length of Time* that had elapsed since burial of the " remains."

1. The state of decomposition of the " remains," and the amount of adipocere, showed that burial had taken place about four to eight months previously.

2. There are difficulties in reckoning definitely how long " remains " have been buried, on account of the facts (i) that there are two kinds of decomposition, viz., common putrefaction (the result of dampness and air), and adipocere formation (the result of dampness without air), and (ii) that lime and clay retard the former, and damp clay favours the latter.

(*c*). *Evidence as to the Cause of Death.*

1. All the organs found were healthy, except that one kidney weighed only $2\frac{1}{2}$ oz. (due, probably, to loss of water from desiccation by the lime), and, further, they were free from wounds, such as those of a pistol or knife, etc.

2. Each separate portion treated for extraction of alkaloids that might be present, showed the presence of the same alkaloid in the following proportions, calculating for the whole organs: Stomach $\frac{1}{30}$ gr., one kidney $\frac{1}{40}$ gr., intestines, $\frac{1}{7}$ gr., and liver $\frac{1}{12}$ gr.

3. The alkaloid found was proved to be mydriatic (by physiological test on cats' eyes), vegetable (by Vitali's test, giving a purple-violet colour tending to fade), non-crystalline under the microscope but gummy (syrupy) on residue, which gave, with hydrobromic acid, round spheres (not crystals), i.e., *hyoscine* and not hyoscyamine or atropine (hyoscine, hyoscyamine, and atropine being the only known mydriatic vegetable alkaloids, and the first-named being the only one that is non-crystalline.

4. The bitter taste of hyoscine is readily disguised by beer or stout, coffee, etc.

The medico-legal and forensic evidence proved that the " remains " found were those of a woman, who had been poisoned by hyoscine, and that such " remains " had been buried from four to eight months. Circumstantial evidence proved the " remains " to be those of Belle Elmore, who had disappeared, and that Hawley Harvey Crippen had administered the hyoscine, cut the body up, and buried it in the cellar of a house.

Signing of Medical Certificates.

The importance of exercising care in the signing of certificates by medical men has been emphasized by a recent case at the Central Criminal Court (September, 1911), when a medical man pleaded guilty to having made a false declaration, by which an "undesirable" obtained a passport, contrary to the regulations. Shortly afterwards the "undesirable" was arrested abroad for pocket-picking at a railway station. The medical man pleaded that he had no idea of the importance of the document at the time that he signed it, and that he treated it simply as an ordinary certificate given as an act of mere good nature. Before signing a certificate, it is necessary to have real knowledge of the applicant's character.

Workmen's Compensation Act.

Several interesting decisions have been given during 1911, under the Workmen's Compensation Act, and these may, with advantage, be put on record for convenient reference, as follow:—

1. *Diseases versus Accidents.*

(*a*). *Appendicitis as an Accident.*—This was the case of Miller *v* Londonderry Collieries Limited, decided at Newcastle on May 4th, 1911. The plaintiff fell back, and immediately felt a pain in his right side. He ceased work for three weeks, returning afterwards to his duties, though still feeling the pain in his side slightly. Shortly afterwards he developed appendicitis, for which he was operated upon. The Court held that the appendicitis was not due to the accident, and judgment was, accordingly, given for the defendants.

(*b*). *Anthrax as an Accident.*—This was the case of Jessop *v.* McLean, McIntyre & Co., decided at Hull on August 4th, 1911. A ship's cook, who was well before the voyage, slaughtered a diseased sheep on board, and the blood bespattered his leg, with the result that he suffered from anthrax. Compensation was claimed, and was awarded by the Judge.

(*c*). *Angina Pectoris as an Accident.*—This was the case of Powell's Tillery Steam Coal Company Limited, appealing against the County Court decision in favour of compensation for a workman, who had heart disease, from which he died after over-exerting himself at his work. The Appeal Court reversed the County Court decision, on the ground that there was no evidence to prove that the accident arose out of the man's employment. In each instance, the plaintiff must prove his case by proof of evidence and not by surmise, conjecture, or guess. In connection with this case, it may be noted that, in the House of Lords, it was held on appeal (Clover, Clayton & Co. *v.* Hughes), that, if death is caused by exertion in the course of the employment of a diseased workman, it is death by accident, although the exertion could not have injured a healthy man.

(*d*). *Carbon Monoxide Pneumonia as an Accident.*—The Court of Appeal, in Auchinlea Coal Company *v.* Kelly (May, 1911), upheld the decision of the Sheriff-Substitute, by which compensation was allowed in a case of death from pneumonia, due to the inhalation of carbon monoxide gas generated by the explosion in blasting. It was held that death was the effect of injury by accident arising out of, and in the

course of, employment. The combustion of gunpowder generated carbon monoxide amongst other things, and this gas caused pneumonia in one of the workmen, who was also kept at the bottom of the mine-shaft, waiting to be hauled up to the surface, for two and a half hours, being exposed during that time to cold and draught. Death from pneumonia resulted eight days afterwards. The definition of "accident" is elastic, implying something unexpected and undesigned, and also some external act which could be the subject of a notice to the employer or employers concerned.

(*e*). *Damage to a Blind Eye.*—In the appeal case of BALL *v.* HUNT AND SONS (March, 1911), the Court held that disfigurement did not necessarily amount to incapacity. A workman (Ball) lost the sight of his left eye sixteen years ago as the result of an accident (eye struck by a piece of steel). He followed his occupation afterwards at full wages. Whilst at work with Messrs. Hunt & Sons, his injured (left) eye was struck with a piece of brick, with the result that inflammation ensued, necessitating the removal of the eye-ball. The County Court Judge held that the incapacity from which the workman (Ball) suffered was due to the accident to the left eye of sixteen years ago, and that therefore his present employers were not liable, although the removal of the eye (the result of the second accident) might have stopped Ball's employment, from the point of view of disfigurement. The Appeal Court upheld this decision.

(*f*). *Infectious Disease as an Accident.*—At the Manchester County Court (held October, 1911), it was held that scarlet fever contracted in a mortuary of a Fever Hospital by the mortuary porter was an accident within the meaning of the Workmen's Compensation Act. The porter's duty was to clean the mortuary at the Fever Hospital, and it was proved that bodies of patients, dead from scarlet fever, had been taken into the mortuary. A previous attack of influenza rendered the patient prone to "catch" the disease of scarlet fever; this was followed by nephritis, which totally incapacitated him from work.

(*g*). *Tetanus as an Accident.*—In the case of REID *v.* WILSON, heard on appeal in the Court of Session (June, 1911), the decision of the Sheriff-Substitute was upheld under the following circumstances: A gardener, on returning home from work, cleaned his boots without taking them off, and in so doing, tore his right thumb under the nail against the lacing-hook of one of his boots. Four days afterwards, tetanus set in, and death followed. There was no evidence as to the source of the bacillus-infected dirt, but it was presumable that it came from the manure and leaf mould of the employer's garden, but the accident did not arise out of, and in the course of, the man's employment. This was not an exclusive presumption, in that the deceased had a private garden of his own, in which he had worked.

(*h*). *Wasp-sting as an Accident.*—At the Attleborough County Court, (July, 1911), the Judge held that a wasp-sting was an accident within the meaning of the Act, and that such accident arose out of, and in the course of, the man's employment. The man was at work threshing wheat at a machine, on the drum of which a swarm of wasps settled, and, whilst attending to his work, was stung, blood-poisoning setting in afterwards and causing death.

2. *Medical Examination of Injured Workman.*—An important appeal case before the House of Lords (November, 1911), laid down that, under Section 4 of the First Schedule of the Workmen's Compensation Act, 1906, "a mere request by a workman that his own medical man should be present was not a refusal to be examined, but that the burden of proving that such request was in the circumstances not unreasonable lay on the workman, so that each case must be decided by the arbitrator on its own merits." The case was MORGAN *v.* DIXON LIMITED (Blantyre Colliery), for compensation for injury to the left foot. The employers appointed a medical man to examine the accident, but the applicant refused such examination except in the presence of his own medical man. The Sheriff-Substitute held that this refusal amounted to "refusal" or "obstruction" under the terms of Section 4 of the First Schedule, and gave judgment in favour of the defendants. On appeal to the Court of Session, the opinion of the Sheriff-Substitute was upheld, on the ground that the workman had no absolute right to insist upon the presence of his own medical man, and that the workman's request was, under the circumstances, unreasonable. This decision was upheld by the House of Lords in the words of the judgment given above.

3. *Medical Referees in Fatal Cases.*—The Court of Appeal held (May, 1911), that it was competent to submit to a medical referee the facts in the case of a dead workman (death being the alleged result of an accident). The accident was fracture of the right leg, and the immediate cause of death was cerebral thrombosis. A medical referee was called in, and gave it as his opinion that the cerebral thrombosis was not caused or accelerated by the accident. Judgment was given by the County Court Judge in favour of the defendants, and the plaintiff appealed, with the result stated above.

4. *Medical Referees as Private Examiners.*—In the case of MACAULEY *v.* SHIPPING FEDERATION OF CARDIFF (May, 1911), it was laid down that a medical referee, who had been appointed by a judge to decide in a compensation case, should not be called in again, in connection with the same case, in a private capacity. A medical referee, appointed by the Court, was called in by the employers, but the case was dismissed in consequence, it being held that such a course was illegal under the Workmen's Compensation Act.

5. *Miscellaneous Points.*—Other points bearing upon the same subject, have been decided by the Court, viz., (*a*) That an employer's doctor cannot always insist on conducting an examination at his own surgery; and (*b*) that an employer's doctor is justified in refusing to examine a workman in a solicitor's office or in the presence of a solicitor. These decisions are important, as the Act itself gives no definite instruction on the point. The most convenient place is the doctor's consulting-room, but, in the case of a serious accident and injury, a hospital or the patient's own home would appear to be more desirable. The examination must be "at reasonable hours" in accordance with the regulations, but the patients (workmen) need not be given previous notice of the intention to examine (Swaffham County Court), nor can such patients insist upon the examination being conducted in the presence of the patients' solicitors or their representatives (Court of Appeal).

II. STATE MEDICINE, INCLUDING LEGAL DECISIONS.

Auto-inoculation in Pulmonary Tuberculosis.

An interesting book has ben published during 1911, dealing with auto-inoculation in pulmonary tuberculosis, and the methods adopted at the Brompton Hospital Sanatorium at Frimley.

Physical signs by themselves are untrustworthy guides to prognosis. The effect of the bacterial products on the general condition must be carefully studied through (*a*) temperature, (*b*) sputum (appearance and quantity), (*c*) patient's own feelings, (*d*) appetite, and (*e*) weight.

Physical exercise induces auto-inoculations, i.e., the introduction of bacterial products into the blood, and systematic graduations of exercise regulate and control the extent of such auto-inoculations. Everything depends upon an accurate adjustment of physical activities to individual needs. Excessive auto-inoculation must be avoided, i.e., the introduction into the blood-stream of more bacterial products than the blood, with its immunizing properties, can counterbalance, as shown by (1) rise of temperature, (2) constitutional symptoms, such as headache, pains in the eyes and limbs, anorexia, or a general feeling of malaise, etc.

Rest.—Complete immobilizaton is required, not simply rest. The patient is not allowed to move, even in bed, to read, to wash, to cut up food, to go to the lavatory, to talk, to receive visitors, to cough unnecessarily, to be examined physically on the old method with auscultation, percussion, stethoscope, etc., to receive letters, etc. In other words, the patient is to be treated like a typhoid patient.

Graduated Exercise.—The object of exercise is to raise the patient's resisting power by stirring up his bacterial products and driving larger and increasing doses into his blood, i.e., to raise his specific resistance. This object is best secured by systematic labour in the form of graduated exercise, followed, of course, by rest—the exercise taking the forms of (1) walking, (2) making beds and cleaning wards, (3) carrying baskets filled with various articles, (4) light work about a house or in a garden, etc. Different patients require different grades, but the principle involved in exercise or labour is the same in all, viz., avoidance of long periods of mental and physical inactivity. Rest and exercise (graduated) are of value in that they affect the blood fluids in the light of the auto-inoculation theory, i.e., the discharge of bacterial products into the blood as a direct result of the exercise (graduated), with the subsequent, and consequent, formation of protective substances. In this connection, it is a noteworthy fact that the opsonic index curves are in inverse ratio to the temperature curves.

As corollaries to this new theory of auto-inoculation and natural immunization may be mentioned the following :—

(1) Prognosis is impossible from physical examination of the chest only. (2) Hæmoptysis is not, except in very rare cases, an unfavourable symptom, is not, necessarily, the result of violent exercise, nor does its presence, necessarily, point to active disease ; and the same remark applies to coloured sputum—a symptom that may be ignored. (3) The presence of tubercle bacilli in the sputum is not, necessarily, a sure and certain sign of active tuberculosis, nor are the positive

reactions of instillations (cutaneous or ophthalmic), or of subcutaneous injections, of tuberculin ; whilst, on the other hand, negative results *per se* mean nothing. (4) Ordinary diet is to be used, and the old ideas of " indiscriminate stuffing " and the " milk treatment " are now exploded—variety and change (including not knowing what is coming) being all that is wanted. Finally, the after-work of the discharged consumptive (so-called " cured " or " arrested ") is important, also nourishing food, regular hours, rest, and pure air.

Acute Epidemic Poliomyelitis (Polio-encephalitis).

Acute epidemic poliomyelitis or polio-encephalitis has recently been made compulsorily notifiable in London and elsewhere. For the past few years, the disease has become widespread in an acute and epidemic form throughout Northern Europe and America. It is sometimes called " polio-encephalo-myelitis," " anterior poliomyelitis," or " epidemic paralysis." It may affect any portion of the nervous system, thereby giving rise to the various well-known types of the disease, e.g., spinal, cerebral, cerebellar, meningeal, bulbar or pontine, ascending or descending, neuritic, abortive, etc.

The *incidence* of the disease is chiefly in young children (second and third years of life) ; its prevalence greatest during July, August, and September in the Northern hemisphere, and during March and April in the Southern ; and its mortality highest in children below one and over ten years.

The *distribution* is relatively more common in small towns and rural districts than in more densely populated cities. N.B.—Investigated epidemics have taken place in England as follows : N.W. coast of Cumberland (Carlisle, Maryport, Barrow, etc.), Midlands (Melton Mowbray, Irthlingborough, etc.), Dorsetshire (Weymouth, Cerne Abbas and Upper Cerne, etc.), Bristol, Upminster, South Shields, Much Hadham, and Cornwall and Devonshire.

The *incubation period* is probably less than six days, and the virus is communicated from person to person, probably by means of secretion from the nose and mouth.

The *after-effects* of the disease (e.g., paralysis and crippling) are serious, being permanent in about 75 per cent of the patients attacked.

The usual *precautionary measures* are called for, viz., notification, isolation, disinfection, and medical supervision of " contacts " or " suspects." Notification is difficult, owing to the variety of the different types presented by the disease, whilst the time necessary for the isolation to continue must be more or less a matter of conjecture —certainly not less than a period of three to four weeks from the subsidence of the acute symptoms. Experimentally, **Urotropin** tends to prevent infection, probably by destroying the actual virus. The quarantine period should be fourteen days (not less), owing to the fact that the experimental incubation period of the disease (in monkeys) is longer than the observational period (in man), viz., twelve days as compared with six days.

The *virus* of the disease, whatever its exact nature, withstands glycerination for many months, and passes through the ordinary standard bacteriological filter (the Chamberland-Pasteur). It is present in the mucous membrane of the nose and in the salivary glands

of an infected monkey, but not in the urine or fæces, i.e., has not yet been isolated therefrom. It has not yet been cultivated on any of the ordinary media, nor has it been seen under the highest powers of the microscope. One attack of the disease gives, apparently, life-long immunity. The infectivity of the virus is not great. Insanitary conditions appear to have no relation to the disease.

Physicians and surgeons can do but little to relieve the disease, which rarely kills its victims, but condemns them to a life of helplessness and deformity.

The *differential diagnosis* as between acute poliomyelitis and cerebrospinal fever is at times difficult, more especially when the medulla, brain, meninges, or special nerves are implicated. The meningeal type may also be confused with tubercular or septic meningitis.

The common form of the disease is, however, easily recognized, the symptoms being as follows: Initial febrile attack, malaise, and drowsiness, accompanied by headache and occasionally by vomiting, with (at times) nasal and pharyngeal catarrh; patient is fretful and objects to be moved; rigidity of neck and spine muscles, with pain and tenderness over the spine, and retraction of the head; plantar, patellar, and abdominal reflexes commonly absent; paralysis supervenes, affecting one or more groups of muscles, especially of the limbs; no characteristic skin eruption; Kernig's sign may be present; etc. The disease may occur without paralysis supervening. Lumbar puncture and a bacteriological and microscopical examination of the spinal fluid show an excess of lymphocytes, but no *Diplococci intracellularis* of Weichselbaum (the specific germ of cerebrospinal fever).

Condensed Milk for Infants.

The Local Government Board has issued during 1911 an important report on the composition of condensed milks, with special reference to their use as food for infants. The chemical analysis and the preparation of condensed milk are fully dealt with, and much authoritative information is given on points deserving public attention. Special mention is made of the "machine-skimmed" and "skimmed" milks, which do not contain the fat necessary for an infant's growth and health. A large number of infants are still fed upon this unsuitable food, not only in the poorer districts of London, but elsewhere.

"Poverty" and "ignorance" are the two words used in the report to explain why the sale and use of this unsatisfactory food continue—the presence of sugar and the viscosity of the condensed milk giving a fallacious appearance of richness, and causing the food to be actually "satisfying" to the infants at the time. The profits made by the retailers are greater on the "skimmed" than upon the "whole cream" varieties—15 to 20 per cent as compared with 10 per cent. Further, the price to the consumer of "skimmed" condensed milk is, bulk for bulk, greater than to the consumer of fresh-skimmed milk, to which sugar is added in the same proportion, by nearly 5d. in every shilling.

The results of the bacteriological examinations of fifteen brands of condensed milks (sweetened and unsweetened, "full-cream" and "skimmed" sweetened), are startling, none of the specimens tested proving sterile! The bacteria were such as are found in the air, probably introduced during the process of preparation. It is only fair to state, however, that the *B. coli communis* group is killed in the

process of condensing, either by heat, or by drying, or by the addition of large quantities of sugar (causing autolysis); and that what is true of *B. coli* is true also of the tubercle bacillus and the specific pathogenic germs of well-known infectious disease. When the tins are opened, the milk becomes liable to contamination in the usual ways.

Rickets is caused by the consumption of "skimmed" condensed milk, the result of malnutrition, and it is probable that even babies fed on "full-cream" condensed milk suffer from rickets in greater proportion than babies fed on fresh "full-cream" milk. There is one obvious conclusion to be drawn, viz., the necessity of labelling all tins of condensed skimmed milk as being unfit for the food of infants. As it is, all tins or other receptacles of condensed, separated, or skimmed milks must be labelled in large and legible type with the words "machine-skimmed milk" or "skimmed milk" (*vide* Sale of Food and Drugs Act, 1899, Sections 1 and 11), but this provision is not sufficient in practice.

The Housing, Town Planning, Etc., Act.

Much attention has been given during the year to the Housing, Town Planning, etc. Act, 1909, in its practical workings and in its interpretation.

A desire has been expressed for an amendment of the Act, so as to make the magistrate the court of appeal, instead of the Local Government Board. It is stated that the Board's inspectors are unduly lenient to owners of alleged insanitary property; and that an appeal to the Board is costly and cumbersome, and not so satisfactory, as far as the owners are concerned, as an appeal to a court of summary jurisdiction. The movement against the Board as a Court of Appeal is certainly growing amongst owners and sanitary authorities.

Sections 15 and 17 of the Act have come in for much attention on account of difficulties in interpretation as to what dwelling-houses come within the latter (the Closing Order Section). Clearly only dwelling-houses that can be proved to be in a state so dangerous or injurious to health as to be unfit for human habitation, i.e., such dwelling-houses as would have warranted being previously represented under Section 32 (now repealed) of the Housing of the Working Classes Act, 1890, together with the following special dwelling-houses defined in the Housing, Town Planning, etc. Act itself, viz., (*a*) Back to back houses under certain conditions (Section 43), and (*b*) Underground rooms habitually used as sleeping-places under certain limitations (Section 17, Subsection 7). Generally speaking, the premises must be dirty, damp, dilapidated, or insanitary (defective construction or site, bad lighting and ventilation, defective drains, defective or obsolete or badly-placed sanitary fittings, etc.), so as to be dangerous and injurious to health. Houses that are simply worn out and dilapidated in consequence, but not insanitary, are not suitable houses to be dealt with under Section 17 (the Closing Order Section) of the Housing, Town Planning, etc. Act, 1909, but, on the other hand, such houses can be dealt with by notices under Section 15, provided that the rents are within the limits stated, viz., not exceeding £40 in London, £26 in other towns of 50,000 or more inhabitants, and £16 elsewhere, and provided that new contracts have been entered into since the date of the passing of the Act, i.e., Dec. 3rd, 1909. Such houses are unfit for human

habitation, and are to be made and kept by the landlords " reasonably fit for habitation in all respects." In these cases, dilapidations (structural) or general want of repair are the chief defects met with, e.g., defective roofs and gutterings, window sashes, frames, and sills, staircases, floorings, walls and ceilings, w.c. doors and seats and flush tanks, sinks, waste pipes and rain-water pipes, paving of yards and forecourts, etc. Also verminous rooms have been held by the Court to come under Section 15. Both types of dwelling-houses, (i.e., for representation under Section 17 or for the service of notices under Section 15) are, in the wording of the Act, " unfit for human habitation," but the former only are, in addition, dangerous and injurious to health, requiring closing orders to be made, whilst the latter, being simply out of repair and generally dilapidated, are to be made reasonably fit in all respects under notices. Under Section 15 there is a rent limit ; under Section 17 there is not. Dwelling-houses, though closed or uninhabited, can be dealt with under both Sections 15 and 17. Notices under Section 17 of the Act, i.e., closing orders of a local authority, must be carefully drawn up in accordance with the prescribed form of document, and must state definitely the powers of appeal given to defendants to the Local Government Board. So the High Court has decided, in the case of Rayner *v.* the Stepney Borough Council (Chancery Division), holding that a footnote in a prescribed document is equally as important as the main context of such document, and must, consequently, be inserted. An injunction was granted against the Stepney Council, restraining them from enforcing a closing order, on account of such order not mentioning the footnote *re* right of appeal of owners under the Act to the L.G.B.

Under Sections 14 and 15 of the Act, a local authority must pass a resolution appointing officers to make the necessary inspections (house to house), as also under Section 32 for powers of entry, inspection, and general administration of the Act.

When closing orders have been made under Section 17, and the dwelling-houses closed have not been rendered fit for human habitation, the local authority *must* proceed to secure demolition under Section 18, within a period of three months.

When notices under Section 15 have been served upon a landlord, who fails to do the work within a reasonable time, or who closes the house or houses concerned, the local Authority must do the work and recover the cost, i.e., a Local Authority must start a house-repairing staff. In any case, officers must be prepared to issue complete specifications of works required under the notices served.

Difficulties have arisen in connection with the getting rid of tenants from houses closed by order under Section 17, there being no penalty, as was the case under Section 32 (repealed) of the Housing of the Working Classes Act, 1890, against refractory occupiers ; whilst difficulties have also arisen in compelling demolition after closure, no provision having been made in the Act for using the premises for other purposes than dwelling-houses. It has been suggested that a magistrate's order to quit the dwelling-houses might be obtained, and that, if such order were refused by the tenants, the local authority could obtain possession under Sections 138–145 of the County Courts Act, 1888, or under the Small Dwellings Recovery Act, 1838, the costs of the proceedings being recoverable from the owner.

Onchocerciasis.

Onchocerciasis is a parasitic condition met with at times in Australian beef, rendering the food "unsound," the worm, known as onchocerca, causing nodules, to be found at times in frozen quarters of meat. It affects not only the surface of the flank and brisket of the forequarter, but also the deep-seated intermuscular fat, and the superficial form may be present without the deep-seated, and *vice versa*. Forequarters are chiefly affected, but also, at times, hindquarters—small areas over the stifle (knee) joints, with somewhat narrow extensions downwards along the fronts of the legs. The present expert view is that the disease is not communicable to man, i.e., the onchocerca is incapable of developing in man as the result of eating meat containing it, either the worm or its embryos. Meat, therefore, which contains the worm in nodules is not dangerous to health and unfit for human food in consequence, but is certainly "unsound."

How the worm gains entrance into the living cattle is not definitely known.

The Australian Government, since Feb. 1st, 1911, has made careful examinations (ante- and post-mortem) of all animals prior to exportation.

Public Health (Tuberculosis) Regulations, 1911.

By issue of the Order, dated Nov. 15th, 1911, and known as the Public Health (Tuberculosis) Regulations, 1911, the compulsory notification of pulmonary tuberculosis becomes complete. This new Order came into force on Jan. 1st, 1912. The action of the Local Government Board in relation to the compulsory notification of consumption or pulmonary tuberculosis is interesting and noteworthy, as showing what can be done quietly and without the natural opposition that arises against any form of openly-expressed compulsory legislation. For many years past the Board has been desirous of making compulsory the notification of consumption, and to that end pressure has been brought to bear upon the Board by many sanitary authorities and other Public Health administrative bodies; but the excuse offered has always been that the time was not ripe—the people were not educated up to compulsory measures in connection with such a widespread disease. A Bill in Parliament would have been defeated if voted upon in Parliament. How was the difficulty to be met? The Board's advisers came to the conclusion that Section 130 of the Public Health Act, 1875, as amended by the Public Health Act, 1896, gave power to the Board, from time to time, to make, alter, and revoke regulations with a view to the treatment of persons affected with any infectious disease and for the preventing of its spread. This liberal interpretation of the Board's powers made the matter simple, and, as a commencement, the Public Health (Tuberculosis) Regulations, 1908, were issued, dealing with the compulsory notification of consumption in connection with all Poor-Law cases (institutional and district). This commencement was found so successful that the Public Health (Tuberculosis in Hospitals) Regulations, 1911, quickly followed, dealing with the disease in connection with all in-patients and out-patients of hospitals, dispensaries, and other institutions (other than Poor-Law). By means of these two sets of regulations,

about two-thirds of the cases of consumption were made compulsorily notifiable, leaving still one-third to be dealt with. The Public Health (Tuberculosis) Regulations, 1911, coming into force on Jan. 1st, 1912, deal with this remaining one-third of the cases. *All* cases of consumption (pulmonary tuberculosis) are now compulsorily notifiable.

Powers are also given under Section 75 of the Public Health Act, 1875, and amending Acts, for the provision of sanatoria and tuberculosis dispensaries by sanitary authorities, and the paying of the necessary expenses out of the rates. In this connection, tuberculosis dispensaries are valuable, the staff concerning themselves not only with the treatment of the patient at the dispensary, but his supervision in his home. Home environment is thus improved, and early cases of the disease in other inmates discovered and brought under treatment as required. The dispensary works with other organizations (voluntary or otherwise) and, if supported by voluntary contributions, with the sanitary authority of the district.

The sanatorium treatment is still on its trial, as is also the tuberculin dispensary, i.e., the special dispensary for the inoculation treatment of patients by tuberculin, e.g., those established in London, Aldershot, Street, Portsmouth, etc.

The final battle is now waged against consumption, and the next fifty years should see the disease as rare as typhus or leprosy in these islands. The latest official statistics are encouraging, and may, with advantage, be put upon record, viz. : In ten years tuberculosis, as a disease, has diminished in England 19 per cent ; in Scotland and Ireland 24 ; in Germany, 18 ; in London, 30 ; in Berlin, 24 ; and in Paris only 3.

Lastly, the Final Report of the Royal Commission on Tuberculosis was issued on July 11th, 1911, and gives definite answers to certain definite questions submitted to the Commission, when appointed by King Edward VII. in 1901. These answers are derived from a mass of experiments carried out, on behalf of the Commission, at Lord Blyth's farm in Essex, and elsewhere, and may be tabulated briefly as follow :—

1. In many cases human tuberculosis is identical with the bovine disease.

2. Mammals and man can be reciprocally infected with the disease.

3. Tuberculosis can be communicated to man from infected cow's milk or tuberculous meat (pork or beef), but the danger from bird tuberculosis is negligible.

4. There are three distinct types of tubercle bacilli, viz., avian, bovine, and human.

5. The bacillus of lupus is of the bovine order, but is of a modified type, and differs in certain respects from the usual " bovine " bacillus found in cattle.

6. Regulations and supervision of milk production and meat preparation are urgently needed in the interests of infants and children, the members of the population especially endangered, and for the reasonable safeguarding of the public health generally, and, consequently, existing regulations and supervision must not be relaxed.

LEGAL DECISIONS.

The following legal decisions, given during 1911, are important in their relation to State Medicine and Sanitary Administration :—

1. Adulteration of Food and Drugs.

(*a*). *Helliwell* v. *Haskins* (*King's Bench Division*).

Sale of Food and Drugs Act Amendment Act, 1879, s. 3—*Milk—Purchasing of sample in course of delivery at the place of delivery.*

Milk was delivered to a woman at the door of her house by pouring it into a jug, as required under an admitted contract to deliver to the woman pure milk from one cow. The milk was paid for at the time by the woman, who afterwards went into the house with the jug in her hand and shut the door. Then the Inspector knocked at the door, which was opened by the woman, still holding the jug in her hand, and the milk was sampled under the Act and found to be, on analysis, adulterated with 30 per cent added water. The Justices *held* that the delivery was completed before the Inspector took the sample, and this decision was upheld on appeal. Appeal dismissed.

(*b*). *Rudd* v. *Skelton Co-operative Society, Limited* (*King's Bench Division*).

Sale of Food and Drugs Act, 1875, s. 6—*Lardine—Addition of water is an adulteration—No statutory standard for lardine.*

There is no statutory standard for added water to lardine (a substitute for lard), and a sample was found to contain 25 per cent, although, out of 34 samples of lard substitutes (of which lardine is one), 28 contained no added water, whilst pure lard contains no water. The Justices held that there could be no conviction, having regard to there being no statutory standard for lardine. *Held*, that the Justices' decision was wrong. Appeal allowed and case remitted.

(*c*). *Williams* v. *Baker* (*King's Bench Division*).

Margarine Act, 1887, s. 6—*Sale of Food and Drugs Act*, 1899, s. 6—*Butter and Margarine Act*, 1907, s. 8—*The word "margarine" to be printed on wrapper in the case of an approved fancy-named article such as Karmo-Margarine.*

A fancy-named margarine known as "Karmo-margarine" was sold by retail, and served in a wrapper on which was printed the fancy name "Karmo-Margarine," as required by s. 8 of the Butter and Margarine Act, 1907, but contrary to s. 6 of the Margarine Act, 1887, which requires the word "margarine" to be printed on the wrapper. The Justice convicted, and an appeal was lodged.

Held, that s. 8 of the Butter and Margarine Act, 1907, had not impliedly repealed s. 6 of the Margarine Act, 1887, as amended by s. 6 of the Food and Drugs Act, 1899. Appeal dismissed.

(*d*). *Rex* v. *Lilley and Another : ex parte Taylor* (*King's Bench Division*).

Summary Jurisdiction Act 1848, s. 1—*Place of abode for service of summons—Estoppel.*

In connection with proceedings under the Sale of Food and Drugs Acts (butter adulteration), at the time of sale to the inspector, it was stated by the shopkeeper that the shop was his private address, though he lived elsewhere. The summonses, when served, were left with a tenant of one of the flats in the building of which the shop formed the ground floor.

Held, that the shop was not the shopkeeper's place of abode within the meaning of s. 1 of the Summary Jurisdiction Act, 1848, as he did not live there, and that the shopkeeper was not estopped from alleging that the summonses were improperly served. Rule absolute.

(*e*). *Chuter* v. *Freeth & Pocock, Limited* (*King's Bench Division*).

Sale of Food and Drugs Act, 1875, s. 25—*Sale of Food and Drugs Act* 1899, s. 20 (1), (6).—*Interpretation Act*, 1889, s. 2 (1)—*False warranty given by limited company.*

Held, that a limited company incorporated under the Companies Acts can be convicted under s. 20 (6) of the Sale of Food and Drugs Act, 1899. Appeal allowed and case remitted.

(*f*). *Thomas Limited* v. *Houghton* (*King's Bench Division*).

Summary Jurisdiction Act, 1848, s. 11—*Sale of Food and Drugs Acts*, 1875, s. 20, *and* 1899, ss. 20 (6), 25—*Continuing warranty and proceedings for false warranty more than six months after date of original warranty but within 6 months of delivery of the milk, which was not up to sample of warranty.*

Held, that, under a continuing or repeated warranty, proceedings taken within six months (calendar) of the date of offence are in accordance with the requirements of the Summary Jurisdiction Act, 1848, s. 11, and that it is unnecessary to take such proceeding within six months (calendar) of the date of the original warranty or contract.

Appeal dismissed.

2. Buildings.

(*a*). *Bain* v. *Compstall Co-operative Society Limited and Swindells* (*King's Bench Division*).

Public Health Act, 1875, s. 157—*Public Health Acts Amendment Act*, 1890, s. 23—*Bylaws relating to new streets and buildings—Sculleries not rooms for human habitation.*

Three cottages were constructed with sculleries, each 8 feet 3 inches in height and without fireplace or flue.

Held, that the sculleries were not rooms which might be used for human habitation. Appeal dismissed.

(*b*). *Minturn* v. *Barry and London County Council* (*King's Bench Division*).

London Building Act, 1894, s. 88 (1), (11)—*A party wall permeated with damp is defective or out of repair.*

Held, that a party wall may be "defective or out of repair" within the meaning of s. 88 (1) of the London Building Act, 1894, if it be permeated with damp, although it is in no way cracked or bulged.

Appeal allowed and case remitted.

(*c*). *London, Gloucestershire & North Hants Dairy Company* v. *Morley and Lanceley and others* (*King's Bench Division*).

London Building Act, 1894, ss. 5, 58—*Party wall for a portion of its height only.*

Held, that a wall may be a party wall for part of its height only, i.e., for the part of the wall used as such. Appeal dismissed.

N.B.—A further appeal was made to the Appeal Court, but the action was settled by consent.

3. Drains and Sewers.

(*a*). *House Property and Investment Company* v. *Grice* (*King's Bench Division*).

Metropolis Local Management Act, 1855, ss. 73, 74, 78, 250—*Combined drain—Evidence of sanction given by Sanitary Authority.*

A combined drainage was found to be defective and to be a nuisance requiring abatement. To show that the combined drainage was a private drain and not a sewer, the following evidence was submitted: (1) Application dated Jan. 28th, 1858; (2) Sanitary Authority's surveyor's estimate of the cost of the work to connect to sewer; (3) Cash book (duly audited), showing entry of payment. No plan was produced, and no minute of the Sanitary Authority authorizing the application.

Held, that the combined drainage was a private drain.

Appeal dismissed.

4. Factories and Workshops.

(*a*). *Taylor* v. *Mark Dawson & Son Limited* (*King's Bench Division*).

Factory and Workshop Act, 1901, s. 13 (1)—*Removing fluff is cleaning machinery in motion—Child at work.*

Held, that the removal by a child of fluff from the rollers and board (partly by the pressure of the hand and partly with the aid of a stick) of a cap-spinning machine for spinning woollen yarn, whilst such machine was in motion by the aid of mechanical power, was cleaning part of the machinery within the meaning of s. 13 (1) of the Factory and Workshop Act, 1901. Appeal allowed and case remitted.

(*b*). *Crabtree* v. *Commercial Mills Spinning Company, Limited* (*King's Bench Division*).

Factory and Workshop Act, 1901, s. 24 (3) (b)—*Cleaning machinery in motion is not employment in a manufacturing process—Women at work.*

Held, that the cleaning of machinery in motion was not employment in a manufacturing process, although the machines were working exactly as if not being cleaned. Appeal dismissed.

(*c*). *Jackson* v. *A. G. Mulliner Motor Body Company Limited* (*King's Bench Division*).

Factory and Workshop Act, 1901, s. 10—*Every hoist or teagle must be fenced, whether or not directly connected with mechanical power.*

Held, that the words " hoist or teagle " are not qualified by the words " directly connected with the steam or water or other mechanical power " in section 10 of the Factory and Workshop Act, 1901, and that every hoist or teagle must, therefore, be securely fenced, whether or not so connected. Appeal allowed and case remitted.

(*d*). *Seal* v. *British Orphan Asylum* (*King's Bench Division*).

Factory and Workshop Act, 1907, s. 1—*Laundry attached to a public institution, to wit an asylum.*

Held, that the British Orphan Asylum at Slough (a home for orphan children, maintained by public subscriptions and donations, but without Government grant and not under public control) was a public institution, and that, therefore, the laundry connected therewith (the work done at the laundry being confined to the washing of linen and clothes exclusively used at such asylum) was carried on incidentally to the purposes of a public institution, to which section 128 of the Factory and Workshop Act, 1901, applied.

Appeal allowed and case remitted.

(*e*). *Sadler* v. *Roberts* (*King's Bench Division*).

Factory and Workshop Act, 1907, s. 1—*Hotel laundry carried on as ancillary to the hotel business.*

The laundry connected with the hotel was not used for the washing of visitors' linen, but only for washing the table linen, sheets, etc., used in the hotel. The Justices decided that such work did not render the laundry ancillary to the hotel business.

Held, that the Justices' decision was wrong.

Appeal allowed and case remitted.

5. Motor Cars.

(*a*). *Brown* v. *Crossley* (*King's Bench Division*).

Motor Car Act, 1903, ss. 2 (2), (4), 4 (1), (2)—*Motor Car* (*Registration and Licensing*), *Order*, 1903, *Article II—Absence of back light—Endorsability of licenses on conviction.*

Held, that, on conviction, the absence of a back light to a motor car on a public highway at night renders endorsable the licences of the proprietor and the driver. Appeal allowed and case remitted.

6. Poisons sold by Chemists.

(*a*). *Pharmaceutical Society* v. *Nash* (*King's Bench Division*).

Pharmacy Act, 1868, s. 15—*Poisons and Pharmacy Act*, 1908, s. 2—*Poisonous insecticides—Liability of unlicensed assistant to licensed chemist.*

Held, that an unlicensed assistant of a person licensed by a local authority under the Poisons and Pharmacy Act, 1908, to sell poisonous substances, is liable to a penalty if he, as assistant, unlicensed, effects a sale on behalf of his licensed master. Appeal dismissed.

7. River Pollution.

(*a*). *Jones* v. *Llanrwst Urban Council* (*Chancery Division*).

Local Government Act, 1894, s. 25—*Public Health Act*, 1875—*Rights of riparian owners—Discharge of sewage into river by Sanitary Authority—Trespass—Liability of Sanitary Authority for acts of its predecessors.*

Held, that a riparian owner on the banks of a natural stream is entitled to the flow of his stream past his land in its natural state of purity, and that any one who causes fæcal matter, or allows it, to escape into a river under such conditions that it is carried to his neighbour's land, by wind or current, is a trespasser on such land, and that the Sanitary Authority, in taking over the sewage disposal works, became liable for the acts of their predecessors and to an injunction. Injunction granted.

(*b*). *Titterton* v. *Kingsbury Collieries Limited* (*King's Bench Division*).

Public Health Act, 1875, ss. 4, 13—*Rights of riparian owners—Discharge of sewage into river—Responsibility of person or persons by whose act or default the pollution arose.*

Held, that the person by whose act and default the pollution of a river with sewage occurred, was liable, even though the sewage works were vested in the local authority. Appeal dismissed.

8. Sewage Removal.

(*a*). *Robinson* v. *Beaconsfield Urban Council* (*Chancery Division and Court of Appeal*).

Public Health Act, 1875, s. 42—*Public Body is liable for its contractor's negligence—Cleansing of cesspools.*

A contractor contracted with a Local Sanitary Authority to cleanse

and remove the contents from cesspools, but no arrangement was made nor instruction given as to depositing the contents of such cesspools. The contractor, without the permission of the Local Sanitary Authority, deposited the contents in such a way as to cause a serious nuisance.

Held, that the Local Sanitary Authority was liable, and an injunction was granted.

9. Unsound Food.

(*a*). *Dodd* v. *Pearson* (*King's Bench Division*).

Public Health Act, 1875, ss. 116, 117, 253—*Unsound meat—Person taking proceedings to be authorized by Local Authority or to have the consent of the Attorney-general—Person aggrieved.*

Held, that proceedings connected with unsound meat could not be taken by a superintendent of police unless he were authorized by the Local Authority or had received the consent of the Attorney-general, such superintendent not being the person aggrieved under s. 253 of the Public Health Act. 1875.

Appeal allowed and conviction quashed.

(*b*). *Salt* v. *Tomlinson* (*King's Bench Division*).

Public Health Act, 1875, ss. 116, 117—*Public Health Acts* (*Amendment*) *Act*, 1890, s. 28—*Articles unfit for food—Seizure and condemnation and destruction.*

Held, that, where the Public Health Acts (Amendment) Act, 1890, has been adopted in a district, s. 28 extends the powers of the Public Health Act, 1875, to *all* articles intended for the food of man, and, further, renders seizure no longer necessary prior either to condemnation or to the imposition of penalties. Appeal dismissed.

10. Water Supply.

(*a*). *Metropolitan Water Board* v. *Colley's Patents Limited* (*King's Bench Division and Court of Appeal*).

Water Works Clauses Acts, 1847, s. 35, 1863, s. 12—*Metropolitan Water Board* (*Charges*) *Act*, 1907, ss. 8, 9, 16, 25—*Water supplied for domestic purposes.*

Water was supplied to a factory and was used for drinking, for personal washing, and for cleansing and flushing urinals and closets used by the employees, and such water-supply was held to be for "trade, manufacture, or business," by the County Court Judge, and, on appeal to the High Court, one Judge (Mr. Justice Phillimore) agreed, and the other (Lord Justice Coleridge) dissented, holding that the supply was for "domestic purposes." On further appeal to the Court of Appeal, it was held that the supply was "for domestic purposes."

Appeal allowed.

III. INDUSTRIAL DISEASES AND TOXICOLOGY.

Diseases in the Electrical Industries.

The increased use of electricity as a motive and illuminative power necessitates a consideration of the dangers that arise, or may arise, from its careless employment.

First, as regards *electrical shocks.* Their danger depends upon the amount of current passing into (or through) the body, the kind of contact, and the insulated position of the individual at the particular time of accident. The danger depends upon the high potentiality of the current, *together with* the conditions under which the current is received. Thus, damp boots, standing on wet soil, and a moist skin will, each and all, aggravate the effects of an electric shock. Further, the " alternating " current is more dangerous than the " continuous." Instant or immediate death takes place when there is a sudden interruption of nerve connections. There may be local destruction of tissue by the current, on entering or leaving the body. Muscles may be thrown into a state of tetanic rigidity, and there may be, in addition, pain arising from, and directly due to (*a*) over-stimulation of sensory nerve endings in the skin, (*b*) strong, cramp-like contractions of muscles, or (*c*) the local action at the point of contact of the accumulated products arising from electrolytic decomposition. Nervousness, with headaches and ill-defined pains throughout the body, may result for a long time afterwards, such symptoms being aggravated by disturbed electrical conditions of the atmosphere. Direct exposure to strong electric light may cause erythema of the skin. Electrical burns cause generally extensive local destruction of tissue, with an angry and gangrenous appearance of the wounds and slow attempt at healing, due to the nerves being included in the process, and an ascending neuritis with (probably) death of portions of the nerves. The cause of death in electric shock is (*a*) inhibition of the medulla oblongata or (*b*) direct action on the muscles of the heart. There are rigidity of the muscles, dilatation of the pupils, congestion of brain and spinal cord, etc., to be noted in addition. Low-tension currents tend to kill chiefly by producing cardiac fibrillation, whilst, as the tension is increased, the effect upon the heart is less pronounced, but the effect upon the central nervous system becomes more and more certain, leading to respiratory failure through inhibition of the medulla oblongata.

Diseases in the Lead Industries.

Sir Thomas Oliver lectured to the London Eugenics Education Society in 1911 on " Lead Poisoning and the Race," lead and its compounds being poisons whose action, although subtle, is unerring. Lead acts upon emunctories such as the kidneys, also upon the blood-making organs and the nervous system, and last, but not least, upon the reproductive powers of man and woman (especially woman).

Developing life is destroyed directly by the poison, or indirectly through its effect on the channels of nutrition of the mother. Hence the necessity of restraining females from the dangerous processes of the manufacture and manipulation of lead and its products. Statistics show that females who worked in lead before marriage miscarried twice more frequently, and females working in lead after their marriage miscarried three times more frequently, than those engaged in ordinary

house-work. In this way the birth-rate is adversely affected. Where the infants live, they grow up physically and mentally below par.

Anaphylaxia, or increased susceptibility to disease after an attack, is characteristic of lead poisoning, and immunity in this disease is rare, if it exists at all.

Improvement of the industrial conditions of the potteries, and abolition of female labour in white lead factories, have removed so many of the evils of plumbism as they affect potential motherhood, that in Great Britain it is difficult to say to what extent plumbism is injuriously influencing the future of the race. The effect upon offspring of paternal and maternal lead intoxication is still under inquiry. It is, however, a fact, that the wives of men working in lead miscarry more frequently than the wives of men following other occupations, and the tendency is greater still when the women themselves also work in lead, showing that it is the embryo that is unhealthy, poisoned by the parent or parents in conception.

Regulations for the prevention of plumbism must be obeyed, even though such obedience may entail considerable personal inconvenience, and health, fitness for work, and longevity will be the result for the workers and their offspring.

As to *diagnosis*, the most important point is the history of the patient's occupation. Overwork is the determining factor in the part of the muscular system involved in the paralysis ; it is not that certain muscles or certain nerves are selected by the poison. Thus, painters and printers have paralysis of the forearms and hands ; and file-makers, who grasp the chisels with the left hands, have paralysis of the left fingers and thumbs ; storage battery workers have paralysis of the muscles of the shoulders ; children, who use their legs more than their arms, have paralysis of the leg muscles, etc. Basophilic granulation of the red cells is a good positive but a bad negative sign. The presence of lead in the urine is a valuable diagnostic sign. Colic and lead gum line are often absent.

The poison is absorbed by the intestinal mucosa, including that of the mouth, and also by the skin. In the form of dust, lead is inhaled and swallowed. It is a cumulative poison. The preventive measures consist of (1) Abolition of dust and the use of respirators ; (2) Short hours of labour to avoid fatigue ; (3) Good food to be taken, specially before work ; (4) Bathing and washing facilities ; and (5) Compulsory medical inspection, so as to detect and remove susceptible workers, etc.

Poisoning by Antimony (Printers' Palsy).

Printers are liable to antimony poisoning, due to the type metal, which is an alloy of lead with 25 to 33 per cent of antimony. The poison gains entrance into the workers as type dust, through handling type, or through inhalation of antimony vapours in the founding processes of printers. Copper and tin may also be present in type metal, but the symptoms sometimes met with are due to the antimony and not to the lead, copper, or tin—as shown by the diseases of the nervous, circulatory, and urinary systems—though the majority of the symptoms are due to the lead.

The introduction of linotype machines seems to have lessened the amount of plumbism amongst printers, and some of the symptoms

found amongst linotype workers may, therefore, be due to antimony, in the form of antimoniuretted hydrogen, due to the action of the electric plant.

Poisoning from Uncommon Sources.

(1). *Acetanilide.*—The ingestion of the aniline derivatives of the antipyretic group is capable of producing profound pathological changes in the blood vascular system, with the production of a perfectly definite symptom-complex, viz., great general weakness, nervous excitability, insomnia, loss of appetite, digestive disturbances, palpitation, dyspnœa, numbness and weakness of the extremities, pain in the region of the liver and spleen, faint attacks, and cyanosis (often extreme but usually fluctuating in intensity), together with marked pallor of the mucous surfaces. There is no clubbing of the fingers.

The blood changes are quite characteristic, and due to the destructive action of a hæmolytic poison, circulating in the blood-stream, which produces a secondary anæmia variable in degree. The erythrocytes are diminished in number, often nucleated, show granular stippling, stain poorly, and are variable in size and form. There is usually a moderate leucocytosis of the polymorphonuclear variety, with a relative increase of the lymphocytes. The hæmoglobin is probably diminished.

The heart, spleen, and liver are enlarged, the spleen and liver being tender to palpation and percussion. The heart sounds are feeble, and adventitious murmurs frequent (systolic, mitral, and tricuspid and basic systolic). The urine is usually dark brown or black in colour, and gives the characteristic indophenol reaction, containing also blood pigments, bilirubin, glycuronates, dextrose, etc. On withdrawal of the poison, the symptoms rapidly improve. Finally, acetanilide is excreted with the urine and can be detected by appropriate and simple tests.

Acetanilide is cheap and extremely toxic, and is the chief constituent of many of the so-called headache or neuralgia powders or tablets.

(2). *Benzol.*—Several cases of poisoning amongst employees in a can factory have recently been investigated, and found to be due to the inhalation of the fumes or vapours of benzol. Anæmia was a marked symptom, especially amongst those engaged in preparing the tops of the cans for sealing, a solution of rubber (dissolved in benzol and thickened by means of bole and ground asbestos) being used for the purpose. As the benzol evaporates, a thin rubber ring is left near the margin of each can top.

Though benzol had been in use for some time without the employees being affected, a certain consignment of the benzol appeared to be connected with the onset of the symptoms. Analysis of this special consignment showed the presence of carbon bisulphide (small quantities as shown by the xanthogenate test), and aniline and nitrobenzine (traces as shown by Jacquemin's test). After fractionation, the distillate was tested again with the Jacquemin's test, which gave a strong dark-blue coloration, showing the presence of more than traces of nitrobenzol.

The cause of the illness of the employees was impure benzol, the impurity consisting of aniline in the form of nitrobenzol, which has a cumulative poisonous action, with symptoms of extreme anæmia

and weakness (ending, at times, in death). The difficulties in detecting small traces of nitrobenzol must be borne in mind in any investigation.

(3). *Cantharides.*—A married woman, aged twenty-nine years, previously healthy, was taken suddenly ill with sickness and faintness, pain in the stomach, back, and intestines, and intense thirst, after taking pills labelled hiera picra, to produce miscarriage. There was a history also of the patient having herself passed a catheter into her uterus. She aborted and died two days afterwards. The symptoms, as narrated at the inquest, were as follows: A distinct coloration of the whole surface of the body, amounting to a kind of reddish-bronze, with a dark, almost black patch extending across the bridge of the nose on to both cheeks—the coloration becoming deeper in hue later. The tips of the fingers were blue, as also the mucous surfaces of the mouth. Suppression or retention of urine, pulse 120, conjunctivæ yellow, pupils contracted, were symptoms also noted. Post-mortem examination resulted as follows: Spleen and kidneys acutely inflamed (intestines slightly), deep staining of inner surface of heart and arteries, no peritonitis, bladder full of urine (blood-stained and albuminous). Cantharidin (small amount) was obtained from the urine, extracted therefrom, after acidulation, by benzene, the crystals being detected under the microscope and forming with oil a blistering fluid when applied to the inner side of the forearm.

(4). *Tragopogon Pratense, or Goat's-beard.*—A boy partook of what are known as "gipsy nuts," and suffered from headache, cyanosis, and semi-consciousness, with small inactive pupils, a thin quick pulse, rapid breathing, and crepitations over both lungs. Temperature 101° F. Death ensued, but the post-mortem examination gave negative results, except a small patch of gastritis close to the œsophageal opening.

The tragopogon pratense is abundant on waste grounds and in rubbish heaps, etc.

The ground "gipsy nuts" were extracted with alcohol in the presence of tartaric acid, the extract was filtered and evaporated, and aqueous filtrates were formed. Tests for alkaloids were negative, but a precipitate was obtained with phospho-molybdic acid, due to some principle other than an alkaloid proper, being not extracted by the ordinary alkaloid solvents and not precipitated by iodine in iodide of potassium or Mayer's solution.

(5). *Vanadium.*—Vanadium is a metal, the pentoxide being used in photography as a developer, the chloride and trioxide as mordants in printing fabrics, and the trioxide in the manufacture of steel (in making easily malleable and ductile alloys). The pentoxide has also been used in medicine.

Vanadiumism is a chronic intoxication, caused by ingestion or absorption of some forms of vanadium, either industrially, medicinally, or accidentally, the principal lesions being found in the lungs, kidneys, and gastro-intestinal tract. The symptoms are anæmia, a dry and irritating paroxysmal cough (with hæmorrhage sometimes), irritation of the nose, eyes, and throat, nausea and diarrhœa (sometimes), to be followed by obstinate constipation. Albumin, casts, and blood are often present in the urine. Neuritic symptoms may be induced.

As preventives in the industrial form of vanadiumism, may be mentioned (*a*) Means to allay and carry off the dust and fumes; (*b*) Perfect ventilation; (*c*) Use of respirators; (*d*) Cleansing and spraying of the nasal and oral cavities, etc.

THE NATIONAL INSURANCE ACT 1911 AND THE MEDICAL PROFESSION.

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Any Act of Parliament, the avowed object of which is to provide for "Insurance against Loss of Health, and for the Prevention and Cure of Sickness," cannot fail to be of much interest and importance to the medical profession. The prevention and cure of sickness are the very objects for which the practice of medicine exists, whilst any sound system of insurance against loss of health must depend in its working on the skilled judgment of medical practitioners, in order that the incapacity for work of insured persons may be gauged, controlled, and, as far as may be, remedied.

The National Insurance Act of 1911 is a most intricate measure, which can only be fully understood after prolonged and patient study, supplemented by practical experience of its operation. The obscurity of its provisions and the doubts as to the probable extent of their scope and incidence have, moreover, been intensified by the clouds of controversy which signalized the introduction of the Bill, and still hover over it in its revised and completed form. This is the more unfortunate, as the Act will without doubt affect profoundly many social, economic, domestic, and professional relations, and its purport should be understood by all responsible citizens, and particularly by medical men.

The outstanding feature of the Act is its wide-reaching application, it being estimated that some fifteen million persons (approximately one-third of the population) come within the scope of its compulsory provisions; to which number must be added those persons who may take advantage of the permission given to certain classes to insure under the Act voluntarily.

For each and all, except in Ireland, the provision of medical attendance and medicine is the primary consideration; "medical benefit" is the last benefit that an insured person forfeits: necessarily so, for it is obviously essential to the financial soundness of the scheme that sick persons should recover their health with as little delay as possible. In Ireland, where medical benefit is not provided, at least ordinarily, provision is made for obtaining from duly qualified medical practitioners the certificates of incapacity for work which are conditions precedent for the obtaining of sick pay by insured persons.

Before considering in detail what is meant by "medical benefit" and for whom it is provided, it may be well to sketch in outline the *machinery by means of which the Act is to be administered and the extent to which the profession of medicine is to be represented on its governing bodies.*

The highest authorities set up under the Act are the *Boards of Commissioners*, of which there are four, acting for England, Scotland, Ireland, and Wales respectively.

One member of each of these boards must be a duly qualified medical practitioner; for the English board, the additional stipulation being made that the medical member must have had personal experience of general practice.

Moreover, the English Board of Insurance Commissioners is required to appoint an *Advisory Committee* for the purpose of giving advice and assistance in connection with the making and altering of regulations under the Act, and on this Committee there must be some "duly qualified medical practitioners who have personal experience of general practice." It would seem that this Committee has no judicial or administrative functions, its duties being confined to the giving of advice; whereas the commissioners have very wide powers both in settling disputed points and in framing regulations for the administration and adaptation of the Act, subject only to appeal on questions as to the right or liability of certain persons to be insured, and to amendment by the King in Council on address by either House of Parliament in the case of regulations.

The detailed working of the Act is to be administered locally, partly by what are known as "*Approved Societies*" (i.e., broadly speaking, Friendly Societies who satisfy certain conditions for approval) and partly by *Local Insurance Committees*, which will be constituted for every County and County Borough.

It is the latter bodies which will administer the medical benefit, and it may be well therefore to indicate their constitution.

The number of the members of each Local Committee is to be determined by the Insurance Commissioners; but in no case must be less than forty or more than eighty, and of these:—

1. Three-fifths, that is twenty-four to forty-eight, are to be appointed to represent insured persons.
2. One-fifth, that is eight to sixteen, are to be appointed by the Council of the County or County Borough.
3. Two are to be elected by the medical practitioners of the County or County Borough.
4. One, or, if the total number of the committee is sixty or upwards, two, or if the total number of the Committee is eighty, three, are to be medical practitioners appointed by the County or County Borough Council.
5. The remainder are to be appointed by the Insurance Commissioners.

In addition, the Medical Officer of Health may, at the request of the Insurance Committee, and with the consent of the authority by whom he is appointed, attend meetings of the Committee and give such advice and assistance as he can.

Further, a *Local Medical Committee* may be formed, and if the Insurance Commissioners are satisfied that it is representative of the medical practitioners in the area administered by the Insurance Committee, they must recognize it, and the Insurance Committee must consult it on all general questions affecting the administration of medical benefit, including the arrangements made with medical practitioners giving attendance and treatment to insured persons.

It will thus be seen that on all the governing and advisory bodies set up under the Act (and in referring to the Act, we mean Part 1, which deals with Health Insurance; Part 2, which deals with unemployment, having no direct medical interest) there is some medical representation, which, although not numerically strong, will doubtless, particularly in regard to purely professional matters, carry weight.

Turning from the administrative machinery, it may be well to indicate *who are the insured persons.* They include, with some, for our present purpose, comparatively unimportant exceptions, all regularly employed persons who earn not more than £160 a year, and some others who are not strictly "employed."

In addition, anyone who is engaged in some regular occupation and is wholly or mainly dependent for his livelihood on the earnings from that occupation, and who has a total income from all sources not exceeding £160 per annum, may be insured, if he so desire.

But are all these insured persons entitled to medical benefit?

Yes, although not necessarily in exactly the same form.

Medical benefit, which includes medical attendance and treatment, the provision of proper and sufficient medicines, and such medical and surgical appliances as may be prescribed by regulations of the Insurance Commissioners, is provided for all insured persons, irrespective of age, nationality, sex, or conduct.

For the purpose of providing medical benefit, every local Insurance Committee will be required to make arrangements with duly qualified medical practitioners, in accordance with regulations of the Commissioners, and these regulations will require the adoption by every Committee of such a system as will secure :—

(*a*). The preparation and publication of lists of medical practitioners, who have agreed to attend and treat insured persons whose medical benefit is administered by the Committee.

(*b*). The right on the part of any duly qualified medical practitioner who is desirous of being included in any such list, to be so included, but subject to the removal of his name from the list where the Insurance Commissioners, after such inquiry as may be prescribed, are satisfied that his continuance on the list would be prejudicial to the efficiency of the medical service of the insured.

(*c*). The right on the part of any insured person to select, at such periods as may be prescribed, from the appropriate list, the practitioner by whom he wishes to be attended and treated, and, subject to the consent of the practitioner so selected, of being attended and treated by him.

(*d*). The distribution of the insured persons (who after due notice have failed to make any selection, or who have been refused by the practitioner whom they selected) amongst (and so far as practical under arrangements made by) the several practitioners whose names are on the list.

(*e*). The provision of medical attendance and treatment on the same terms as those arranged with respect to insured persons for persons who were members of any friendly society which becomes an approved society at the passing of this Act, but who are not entitled to become insured persons because they are over the age of sixty-five or are permanently disabled.

These are the general arrangements, providing for a list of doctors, from which insured persons will have free choice of their medical attendants, subject to the consent of the persons selected.

A medical man, it will be noticed, can insist on his name being placed on such a list, but may have it removed by the Insurance Commissioners, if it appears to them to be desirable to do so in the interests of the service.

There is, apparently, no appeal from any such action of the Commissioners, so that it will be important to make sure that any regulations by which inquiries will be governed, provide for the adequate presentation of the point of view of the practitioner concerned.

If the practitioners, included in any list, are not in the opinion of the Insurance Commissioners, after inquiry, such as to secure adequate medical service in any area, the Commissioners may dispense with the necessity of the adoption of the above system, as respects that area ; and may authorize the Local Committee to make such other arrangements as they, the Commissioners, may approve; or the Commissioners themselves may make such arrangements as they think fit ; or may suspend the right to medical benefit of any insured person in the area, for such period as they think fit, and may pay to such insured person a sum equal to the estimated cost of his medical benefit during that period.

The regulations made by the Insurance Commissioners shall authorize the Local Insurance Committees, by which medical benefit is administered, to require any persons whose income exceeds a limit to be fixed by the Committee, and to allow any other persons, in lieu of receiving medical benefit under such arrangements as described above, to make their own arrangements for receiving medical attendance and treatment, including medicines and appliances ; and in such cases the Local Committee must, subject to the regulations, contribute (from the funds out of which medical benefit is payable, towards the cost of medical attendance and treatment, including medicines and appliances for such persons) sums not exceeding in the aggregate the amount which the Committee would otherwise have expended in providing medical benefit for them.

These latter provisions were apparently inserted to meet the wishes of medical men for an income limit for insured persons.

It has, however, been stated, semi-officially, that the persons who receive sums of money in lieu of medical benefit, may expend such money, if they so desire, in obtaining the services of unqualified medical practitioners, or presumably, quacks of any description. It is difficult to see how in such a case the measure of incapacity for work of an insured person is to be gauged, as it would seem that no approved society or Insurance Committee would willingly pay sickness or disablement allowances without a certificate from a qualified medical practitioner that the person seeking such allowance was, by reason of ill-health, unable to work.

The regulations may also provide that in the case of persons who are entitled to receive medical attendance and treatment under any system or through any institution existing at the time of the passing of this Act, and approved by the local Insurance Committee and the Insurance Commissioners, such medical attendance and treatment may be treated as, or as part of, their medical benefit under the Act ; and may provide for the Committee contributing towards the expenses thereof, the whole or any part of the sums which would be contributed in the case of persons who have made their own arrangements as above ; but no such regulation may deprive any person of his right of selecting the medical practitioner by whom he wishes to be attended and treated.

This is the substance of the famous Harmsworth clause, which seems calculated to perpetuate to some extent the evils of what is generally known as " club practice."

Before considering what remuneration should be, or is likely to be, offered for attendance on, and treatment of, insured persons, it may be well to indicate how the *supply of proper and sufficient drugs and medicines, and prescribed appliances*, is to be carried out. It is enacted that every Local Committee must make provision for the supply of proper and sufficient drugs and medicines and prescribed appliances to insured persons, in accordance with regulations made by the Insurance Commissioners, and such regulations must provide for the arrangements made being subject to the approval of the Insurance Commissioners, and being such as to enable insured persons to obtain from any persons, firms, or bodies corporate with whom arrangements have been made, such drugs, medicines, and appliances as may be ordered by the medical practitioner by whom they are attended, and must require the adoption by every Local Committee of such system as will secure :—

1. The preparation and publication of lists of persons, firms, and bodies corporate who have agreed to supply drugs, medicines, and appliances to insured persons whose medical benefit is administered by the Committee, according to such scale of prices as may be fixed by the Committee.

2. The right on the part of any person, firm, or body corporate, desirous of being included in any such list, of being so included for the purpose of supplying such drugs, medicines, and appliances as such person, firm or body corporate is entitled by law and authorized by the Committee to supply (except in cases where the Insurance Commissioners, after inquiry, are satisfied that the inclusion or continuance of the person, firm, or body corporate in such list would be prejudicial to the efficiency of the service) ; provided that :—

(*a*). If the Insurance Commissioners are satisfied that the scale of prices fixed by the Committee is reasonable, but that the persons, firms, or bodies corporate included in any list are not such as to secure adequate and convenient supply of drugs, medicines, and appliances in any area, they may dispense with the necessity of the adoption of the above described system as regards that area, and authorize the Committee to make such other arrangements as the Commissioners may approve.

[NOTE.—The supply of drugs and medicines in this country can be undertaken by any shopkeeper, with the exception of such drugs or medicines as are or contain poisons included in the Schedule of the Poisons and Pharmacy Act, 1908.]

(*b*). Except as may be provided by the Insurance Commissioners, no arrangement shall be made by the local Insurance Committee with a medical practitioner, under which he is bound or agrees to supply drugs or medicines to any insured persons.

(*c*). Subject to the foregoing provisions, the regulations shall prohibit any arrangement for the dispensing of medicines being made with persons, other than persons, firms, or bodies corporate entitled to carry on the business of a chemist and druggist (under the provisions of the Pharmacy Act, 1868, as amended by the Poisons and Pharmacy Act, 1908) who undertake that all medicines supplied by them to insured

persons shall be dispensed either by or under the direct supervision of a registered pharmacist, or by a person who for three years immediately prior to the passing of this Act has acted as a dispenser to a duly qualified medical practitioner or to a public institution.

[NOTE.—There is no authoritative definition of dispensing, but in the case of BERRIE *v.* HENDERSON, L.R. 5 Q.B. 296, Mr. Justice Lush remarked: "What I understand to be involved in the word 'dispensing' is the making up of something that is prescribed, and selling it with directions how it is to be used." Apparently, therefore, if a medical practitioner, employed under this Act, orders an insured person to take, for example, cod-liver oil, without specific directions, the insured person can obtain that article from any person, firm, or body corporate, included in the list of authorized suppliers of drugs and medicines; but if a medical practitioner prescribes, with directions, any drug or medicine for an insured person, so that the supply of it comes within the definition of dispensing, such supply can only be made by a person, firm, or body corporate entitled to carry on the business of a chemist or druggist under the provisions of the Pharmacy Acts.]

As indicated above, the supply of drugs or medicines which are or which contain scheduled poisons, whether such supply comes under the definition of dispensing or not, can only be made by persons, firms, or bodies corporate entitled to carry on the business of a chemist or druggist under the Pharmacy Acts.

Those entitled to carry on the business of a chemist and druggist under the Pharmacy Acts are:—

1. Registered pharmacists.

2. Representatives of a deceased pharmacist whose business is bona fide conducted by a registered pharmacist.

3. Corporate bodies, and, in Scotland, firms and partnerships, whose business, so far as it relates to the keeping, retailing, and dispensing of poisons, is under the control and management of a superintendent who is a registered pharmacist.

4. Medical practitioners.

(*d*). Nothing in this Act shall interfere with the rights and privileges conferred by the Apothecaries Act, 1815, upon any person qualified under that Act to act as an assistant to any apothecary in compounding and dispensing medicines.

The Apothecaries Act of 1815 provided that no person should act as an assistant to an apothecary in compounding or dispensing medicines, unless he had passed an examination held by the Society of Apothecaries; but seeing that apothecaries as a separate class are obsolete, and that the assistant's examination of the Apothecaries' Society does not confer any right to sell scheduled poisons, this provision of the Apothecaries Act has little, if any, relation to the Insurance Act.

We turn now to the important question of the *remuneration of medical practitioners* for services rendered to insured persons and of suppliers of drugs and medicines for articles provided for them.

There is no mention of any sum of money, exact or approximate, for these purposes, in the Act; but the Act provides for certain definite contributions to be made by and on behalf of insured persons and for State grants.

From these data actuarial calculations have been made as to the amount of money which will be available and the approximate sums which will be required for providing benefits for the number of insured persons who are estimated to require them in each year. The Government actuaries have taken the sum of six shillings per annum for each insured person as sufficing to provide medical benefit (including drugs and medicine) for those who will require it. This sum is chiefly based on the expectation of sickness in friendly societies—in all probability a fallacious basis for the Government scheme, which will almost certainly be liable to a larger drain on its resources by reason of malingering than any well-managed friendly society has ever experienced.

Again, it should be explained that insured persons under this Act are divided into two classes, those who are members of approved societies, and those who are "deposit contributors," whose contributions are paid into the Post Office Fund. The latter class are not really insured at all, their claim to benefits being limited by the amount standing to their credit in the Post Office Fund. It follows that all who can will join some approved society, but the approved societies have almost absolute power to refuse admission, and will undoubtedly, in the interests of their existing members, keep out all who, by means of physical weakness or other cause, are likely to be or become bad lives.

Whether or no the estimated sum of six shillings per annum for each insured person will suffice to provide medical benefit for members of approved societies, it is obvious that it will be inadequate for the segregated bad lives dependent on the Post Office Fund.

But is the sum of six shillings an absolute maximum? It would appear not. There are, indeed, certain margins allowed by the actuaries in their calculations, but these will probably be required for other purposes, and should not be depended upon. Of more importance are the provisions of Subsections 7 and 8 of Section XV. of the Act, which read as follows:—

"(7). If in any year the amount payable to an Insurance Committee in respect of all persons for the administration of whose medical benefit it is responsible is insufficient to meet the estimated expenditure thereon, the Committee may, through the Insurance Commissioners, transmit to the Treasury and to the Council of the County or County Borough an account showing the amount so payable and the estimated expenditure, and the Treasury and the County Council or the Council of the County Borough may, if they think fit, and if satisfied that the amounts so payable and the proposed expenditure are reasonable and proper in the circumstances, sanction the expenditure."

"(8). The Treasury and the Council of the County or County Borough sanctioning any such expenditure as aforesaid, shall thereupon be liable to make good, in the case of the Council of a County or County Borough, out of the County fund or Borough fund or Borough rate, as the case may be, one half of any sums so sanctioned by them and expended by the Insurance Committee on medical benefit in the course

of the year in excess of the amounts so payable to the Insurance Committee as aforesaid."

Further, the Insurance Commissioners have by the provisions of Section LXXVIII, plenary powers to do anything which is necessary or expedient for bringing the Act into operation, so presumably may raise the amount of the contributions made by or on behalf of insured persons, if it be found essential to increase the sums of money available for medical benefit.

The second benefit provided by the Act is "*Sanatorium benefit,*" that is, "Treatment in sanatoria or other institutions or otherwise, when suffering from tuberculosis, or such other diseases as the Local Government Board with the approval of the Treasury may appoint."

It will be noted that this provision is wide enough to cover any kind of treatment for tuberculosis or other appointed disease, so that any medical objection to treatment in sanatoria does not necessarily apply to the "sanatorium benefit" of this Act.

This sanatorium benefit will be administered by the Local Insurance Committees, who will be required to make arrangements to the satisfaction of the Insurance Commissioners :—

1. With a view to providing treatment for insured persons suffering from tuberculosis, or such other diseases as may be appointed, in sanatoria and other institutions, with persons or local authorities (other than Poor Law authorities) having the management of sanatoria or other institutions approved by the Local Government Board. It will be lawful for a local authority to provide such treatment for insured persons resident outside the area of the local authority, as well as inside such area.

2. With a view to providing treatment for such persons, otherwise than in sanatoria or other institutions, with persons or local authorities (other than Poor Law authorities) undertaking such treatment, in a manner approved by the Local Government Board, which treatment (including the appointment of offices for the purpose) it shall be lawful for the local authority, if so authorized by the Local Government Board, to undertake.

The expenses of providing sanatorium benefit will be defrayed as follows :—

One shilling and threepence in respect of each insured person resident in the County or County Borough will be contributed annually out of funds from which benefits are payable under this Act. One penny in respect of each such person will be payable annually out of moneys provided by Parliament. The Insurance Commissioners may retain the whole or any part of the latter sum for the purposes of research.

This last apparently innocent provision has roused the ire of anti-vivisection societies.

No insured person will be entitled to sanatorium benefit, unless the Local Insurance Committee recommend his case for such benefit.

The Local Insurance Committee may, out of the sums available for defraying costs of sanatoria treatment, pay, in whole or in part, the expenses of the conveyance of an insured person to or from any sanatorium or institution to which he may be sent for treatment, or may make advances for such purposes.

Local Insurance Committees may, if they think fit, extend sanatorium benefit to dependents of insured persons.

If, in any year, the amount available for defraying the expenses of sanatorium benefit is insufficient to meet the estimated expenditure, the Local Committee may, through the Insurance Commissioners, transmit to the Treasury and the Council of the County or the County Borough an account showing the estimated expenditure and the amount available towards it; and the Treasury and Council may, if they think fit, sanction such estimated expenditure.

On such sanction being obtained, the Treasury and the Council will each be liable to make good, in the case of the Treasury out of moneys provided by Parliament, and in the case of the Council out of the County fund or Borough fund or Borough rate, one-half of the excess of any such expenditure over the amount ordinarily available for sanatoria benefit.

The Council of any Borough or Urban or Rural District may agree with the Council of the County in which the Borough or District is situate, to repay to the latter Council the whole or any part of the sums payable by that Council towards the excess expenditure on sanatorium benefit, so far as such excess is properly attributable to the Borough or District; and any sums payable by the Council of the Borough or District in pursuance of such an agreement shall be payable in the case of a Borough out of the Borough fund or Borough rate, and in any other case as part of the general expenses incurred by the Council in the execution of the Public Health Acts.

If any sum has been made available for the purposes of the provision of sanatoria and other institutions for the treatment of tuberculosis or such other diseases as the Local Government Board with the approval of the Treasury may appoint, by any other Act of the 1911 Session of Parliament, such sum shall be distributed by the Local Government Board with the consent of the Treasury in making grants for those purposes, and the Treasury before giving their consent shall consult with the Insurance Commissioners; and the money shall be apportioned between England, Wales, Scotland, and Ireland in proportion to their respective populations as at the census of 1911. If any such grant is made to a County Council, the Local Government Board may authorize the County Council to provide any such institution, and to manage and maintain it, and to make arrangement with local Insurance Committees, any expenses not met by the grant being defrayed out of the County fund.

To facilitate co-operation amongst Councils of Counties and County Boroughs and other local Authorities (except Poor Law Authorities) for the provision of such sanatoria, etc., the Local Government Board may make provision for joint committees or boards.

A Local Insurance Committee may, with the consent of the Insurance Commissioners, enter into agreements with any persons or authorities (except Poor Law authorities), that, in consideration of such persons or authorities providing treatment in a sanatorium or other institution, or otherwise, for persons recommended by the Committee for Sanatorium benefit, the Committee will contribute, out of the funds available for sanatorium benefit, towards the maintenance of the institution or provision of the treatment, annual or other payments.

Sickness benefit and *Disablement benefit* which consist of periodical payments to insured persons whilst they are rendered incapable of work by some specific disease or by bodily or mental disablement, are not of direct medical interest, although, as already submitted, it will require medical skill to determine in each case the always difficult question of incapacity for work. It may be noted, however, in passing, that these allowances are only to be made during total incapacity, and will not (ordinarily) be continued after the insured person becomes capable of doing some work, although not necessarily of following his normal employment.

Maternity Benefit, on the other hand, which consists of thirty shillings to be expended for the benefit of the wife (or widow in respect of a posthumous child) of an insured person on her confinement, or for the benefit of a female insured person on her confinement, is, as will be seen on consideration of the details of the benefit, of interest to all general practitioners.

Maternity benefit, for the wife of an insured person, will be treated as a benefit for her husband, and will be given in cash or otherwise by the approved society of which he is a member, or, if he is a deposit contributor, by the Local Insurance Committee. In the case of a posthumous child, it will be payable as if the husband were alive.

Maternity benefit for a woman who is herself an insured person and not the wife (or in the case of a posthumous child the widow) of an insured person, will be treated as a benefit for the woman, and will be administered in cash, or otherwise, by the approved Society of which she is a member, or if she is a deposit contributor, by the Local Insurance Committee. In every case the mother must decide whether she will be attended by a duly qualified medical practitioner or by a duly certified midwife, and must have free choice of such practitioner or midwife. If, a midwife being selected, a duly qualified medical practitioner is subsequently summoned in pursuance of the rules made under the Midwives Act, 1902, the prescribed fee will, subject to regulations made by the Insurance Commissioners, be recoverable as part of the maternity benefit.

It will be remembered that rules which have been made under the Midwives Act provide that, in difficult cases, midwives must call a medical practitioner to their assistance, and in some cases the fee of such medical practitioner will be paid by the Guardians. In deciding whether or not they shall make an order under the Bastardy Laws Amendment Act, 1872, for the payment of the expenses incidental to the birth of a child, the justices shall not take into consideration the fact that the mother of the child is entitled to receive maternity benefit under this Act.

Without prejudice to any other legal liability, when maternity benefit is given or paid to the husband, it will be the duty of the husband to make adequate provision to the best of his power for the maintenance and care of his wife during her confinement, and for a period of four weeks after her delivery, and if he neglects or refuses to do so, he will be liable, upon summary conviction, to imprisonment, with or without hard labour, for any term not exceeding one month.

It will be noted that, in the above enactments, there is no provision as to what part, if any, of the not very large sum of thirty shillings

is to be reserved as a fee for the medical practitioner who may be called in.

Possibly this will be dealt with in regulations, which may provide for the thirty shillings not being paid at all to the beneficiaries, but being expended in necessary fees, and the balance, if any, in orders for food and clothing.

The only part of the Act, except the special provisions for *Ireland*, wherein Medical Certificates are specifically mentioned, is Section LXVIII, which deals with *protection against distress and execution* in certain cases, and provides that when the medical practitioner attending on any insured person in receipt of sickness benefit certifies that the levying of any distress or execution upon any goods or chattels belonging to such insured person and being on premises occupied by him, or the taking of any proceedings in ejectment, or for the recovery of any rent, or to enforce any judgment in ejectment against such person, would endanger his life, and such certificate has been sent to the Insurance Committee and duly recorded, it shall not be lawful during any period named in the certificate for any person to levy such distress or execution, or to take any such proceedings, or to enforce any such judgment against the insured person.

The Registrar of the County Court may, upon the application of any person desirous of levying distress or execution, or taking proceedings, or enforcing a judgment, cancel or modify such certificate if, in his opinion, the certificate is not accurate.

There will be no appeal against the decision of the Registrar.

Any such medical certificate will continue in force for any period named in it not exceeding one week, but may be renewed from time to time for any period not exceeding one week up to three months from the date of its first grant.

Much difficulty has been caused, in the working of Workmen's Compensation Acts, by the refusal of sufferers to undergo *operations* which their medical advisers consider to be necessary in order to effect a cure. This question is dealt with in the National Insurance Act, but almost entirely from the point of view of the insured person.

Approved Societies have power to make rules defining (*inter alia*) what is misconduct sufficient to incur the loss or suspension of benefits, but it is expressly provided in the Act (Section XIV. 2, *e*) that "no such rule shall prescribe any penalty, nor shall any insured person be subject to any penalty, whether by suspension of benefit or otherwise, on account of the refusal by any such person to submit to a surgical operation, or vaccination, or inoculation of any kind, unless such refusal in the case of a surgical operation of a minor character, is considered by the Society, or on appeal the Insurance Commissioners, unreasonable."

A few words may be added in regard to *the position of hospitals, dispensaries, and other institutions of a charitable nature.*

The need for their out-patient departments should doubtless be lessened by the Act, if it operates as it is intended to do, as practically all workers will be provided with medical treatment for their minor ailments. Serious complaints will, as now, in a great many cases

require hospital treatment, and in view of the probable decrease in the amount received from employers, workmen, and others as voluntary gifts, in consequence of the compulsory contributions for insurance levied upon them, it is important to ascertain if hospitals and other charitable institutions will receive any grants from the Insurance Fund.

By Section XXI. it is made lawful for an approved Society or Insurance Committee to grant such subscriptions or donations as it may think fit to hospitals, dispensaries, and other charitable institutions. But this is merely an enabling section, which may or may not be put into practice.

Can the hospitals charge the Insurance Fund with the cost of maintenance and treatment of insured persons? Only to a very limited extent. By Section XII. it is provided that "no payment shall be made on account of sickness, disablement, or maternity benefit to or in respect of any person during any period when the person to or in respect of whom the benefit is payable is an inmate of any workhouse, hospital, asylum, convalescent home, or infirmary supported by any public authority or out of any public funds, or by a charity, or voluntary subscriptions, or of a sanatorium or similar institution approved under this part of this Act." But the funds so released are not necessarily available for payment to the institution, the dependents of the insured person, if he has any, having a prior claim upon them.

It is only where the insured person, receiving treatment, has no dependents, and is a member of an approved Society, and an agreement has been made between the Society or Committee and the hospital, asylum, convalescent home, or infirmary, that the sickness or disablement benefit to which the insured person is entitled may be paid, in whole or in part, according to the agreement, towards the maintenance of the insured person in the hospital, asylum, convalescent home, or infirmary.

Further, any part of the benefit which is not paid to the dependents of the insured person, nor to the institution, may, if the society or committee thinks fit, be applied in the provision of any surgical appliances required for the insured person or otherwise for his benefit.

If the insured person is a married woman or widow, and is entitled to both sickness or disablement benefit and maternity benefit, the maternity benefit may not be paid or applied for the relief or maintenance of her dependents, but may be paid to the institution of which she is an inmate, as if she had no dependents.

It is impossible to sketch even in outline the provisions of a lengthy and intricate statute within the limits of a short article, but we trust we have succeeded in indicating the principal ways in which the National Insurance Act will probably affect the medical profession, and it only remains to emphasize the necessity of studying the regulations which will be issued by the Commissioners, as they will doubtless clear many moot points, and will in any case be of profound importance to all who will be concerned with the working of the Act.

THE EDITOR'S TABLE.

In this section we endeavour to bring before our readers the work that is being done by inventors, and the manufacturers on their behalf.

Each article sent for notice should be described on a *separate sheet of paper*, to which is attached a copy of any illustration for which insertion is desired. These should not be large. Such description must contain some claim to *novelty* or *improvement*.

Medical Inventors should avoid giving technique of operation, but merely describe the instrument or appliance itself.

In respect to Pharmaceutical products and Dietetic articles, we are always ready, when a sufficient quantity is sent to us *early in the year*, to arrange for it to be tested in Hospital practice and reported upon; under other circumstances our knowledge is necessarily more limited; but frequently the simple information as to where a particular preparation can be obtained is all the practitioner requires. We are anxious to express no opinion except as a result of practical knowledge, and it is owing to this fact that a notice in the *Medical Annual* has come to be valued.

Samples and particulars for this section should be sent before Nov. 15th. It is much to the interest of manufacturers to observe this rule.

MEDICAL AND SURGICAL APPLIANCES.

Asepsis of Instruments.—Sterilization by boiling is destruction to the polish of steel and to the edge of the steel blades. It also occupies much time, both for the process and the subsequent drying. It has been discovered that the best way of preserving both the lustre and the edge of steel instruments is never to dry them at all, but to keep them immersed, when not in use, in an antiseptic solution, and merely rinse them in hot water before use. To obtain a rust-proof solution, tentative efforts have been made with absolute alcohol and lysol dissolved in methylated spirit, but it is important that such solutions should not evaporate. A very cheap aqueous solution, which is non-poisonous, has been brought to our notice, which preserves the polish and edge of instruments in a remarkable manner. This is called "Brytstele," and can be obtained from The Medical Supply Association, Gray's Inn Road, W.C. For surgical purposes it is prepared with $2\frac{1}{2}$ per cent cresol, which will effectively destroy any form of germ. We find that instruments immersed

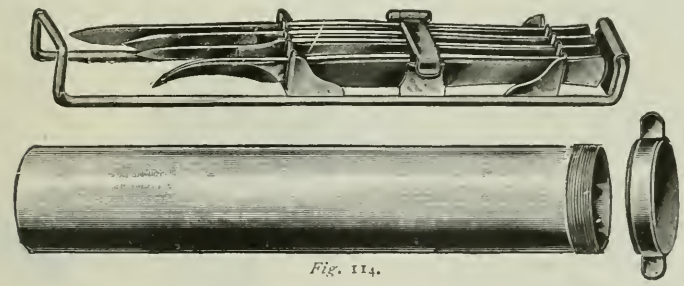

Fig. 114.

in this solution, even if stained, will come out with a brighter polish. Experiments made with a safety razor proved that when never taken apart, but simply immersed in the solution after use, the blade remained sharp for at least double the usual time. For surgical instruments we find a glass tray covered with a piece of glass a simple way of preserving them between use. The solution being translucent, the instruments can be picked out as required, and without drying carried, in a boiled cloth or placed in a metal box, to the place of operation. They are immersed in hot water before and after use.

The Medical Supply Association, also send us a metal case in which a Syme's knife, Paget's knife, scalpel, and bistoury, can be carried immersed in the solution(*Fig.* 114).

Messrs. R. Sumner & Co., of Liverpool, have also adopted this idea for hypodermic syringes and needles. They send us a most ingenious appliance which has a hypodermic syringe with metal plunger, in every way efficient, surrounded by six needles of different lengths. This is kept completely plunged in the Brytstele solution, and when required for use, by means of a spring the syringe and needles appear above the edge of the glass vessel, ready for service. There is no necessity to wire the needle afterwards, or to sterilize it before use. It is always ready, and only requires a little boiled water to be syringed through the needle before it is used. As hypodermic syringes are most frequently used to meet emergencies, the simplicity and efficiency of the apparatus will be readily recognized. All our medical friends who have seen it say at once that "they must have one."

Bandages (Elastic).—Under the name of "The Omnium Bandage," a material, quite free from rubber, has been produced, which has a large amount of elasticity. It can be washed or boiled as often as desired, without deterioration. It can be used either for wet or dry dressings. A further advantage is that it is elastic in all directions. We regard it, unquestionably, as a great addition to our resources. There is nothing else equivalent to it on the market Supplied by The Medical Supply Association, Gray's Inn Road, W.C.

Fig. 115.

Adhesive Elastic Bandage (*the "Domen"*) is a distinct advance in the treatment of conditions where compression is required. The plaster for the bandage, which corresponds closely to lead plaster, is spread upon an elastic material somewhat resembling that of the crêpe Velpeau bandage. When the plaster is slightly warmed and applied, its elasticity enables much firmer pressure to be used than in any other way, and it adapts itself more easily to the contour of the part (*Fig.* 115). The bandage, when once applied, does not appear to be affected either by hot or cold water, nor does it become loose after a few days, as is the case with the ordinary plaster. We regard this new bandaging as a very distinct addition to surgical resource. It is manufactured by The "Domen" Belts Co. Ltd., 456, Strand, W.C.

Blood Test Case.—The "Soloid" blood-test case (*Fig.* 116) recently introduced by Messrs. Burroughs Wellcome & Co. measures only $4 \times 3\frac{1}{2} \times 1\frac{1}{2}$ inches; yet the contents are so comprehensive as to include all the materials required for the speedy preparation of blood, pus, and tissue films. The contents comprise "Soloid" brand Romanowsky stain (Leishman's powder), a 20-c.c. drop-bottle containing distilled water; two 10-c.c. stoppered phials of methyl alcohol; 1 c.c. pipette; grease pencil, and vest pocket case containing six microscopic slides and Hagedorn needle in carbolized alcohol. The case is made of nickel-plated metal, and is protected against damage by a doeskin cover

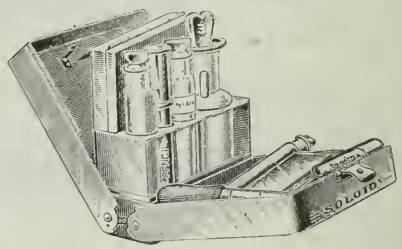

Fig. 116.

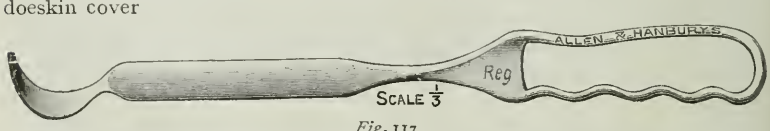

Fig. 117

Bone Elevator (Lane's).—This instrument is extremely useful in many ways during the surgical treatment of fractures. In the first place the pointed

end makes an excellent periosteal detacher, the flat shaft keeps the muscles retracted and well out of the way of the operator, and the shape of the instrument makes a lever for elevating the bone should the work be in a very deep cavity. It is made from Mr. Arbuthnot Lane's design by Messrs. Allen & Hanburys Ltd., 48, Wigmore Street, W.

Bone-holding Forceps.—Designed by Mr. Arbuthnot Lane, the advantages claimed for this forceps are that the length of the instrument gives considerable leverage in moving and holding large bones, and also that the shape of the jaws (*Fig.* 118) having been carefully worked out, there is no danger of

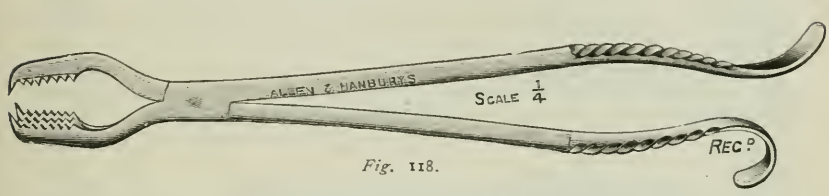

Fig. 118.

the bone slipping. The plate can therefore be accurately applied whilst the forceps hold the bone in position. They are made by Messrs. Allen & Hanburys, Ltd., 48, Wigmore Street, W.

Breast Reliever ("Grevillite").—This is furnished with a metal pump (*Fig.* 119) that we have found very efficient in use, and a great advantage

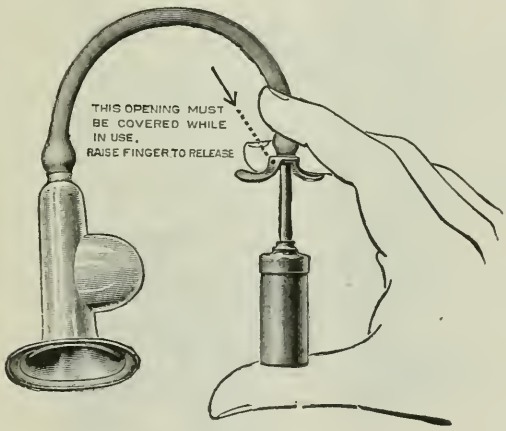

Fig. 119.

over the rubber ball, which is so liable to perish. It costs only 2/–, and is supplied by The Medical Supply Association, Gray's Inn Road, W.C.

Catheters.—Messrs. Reynolds & Branson, of Leeds, send us a catheter, in which woven silver wire is used as the basis, instead of silk or linen, and the result is the most insinuating catheter that has yet come under our notice. It seems to combine rigidity with flexibility in just the right proportions, and we think that those who have used one of these instruments will not readily go back to the older kind. They have also improved on the ordinary rubber catheter, by making one considerably firmer than those formerly in use, and this is a very distinct advantage where a soft catheter is required It is called the "Rystos" catheter, and it has a boule tube, and a funnel end.

The "Bulbique" Catheter.—This is a toughened glass female catheter, made bulbous at its extremity, so as to readily take about two yards of indiarubber tubing (*Fig.* 120). When the catheter is passed, the urine flows into a recep-

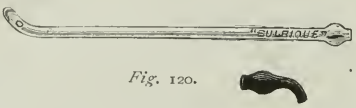

Fig. 120.

tacle placed upon the floor, which saves all risk of soiling the bed or exposing the patient. It is designed by Dr. A. Campbell Stark, and manufactured by Messrs. C. J. Hewlett & Son, Ltd., 35–42, Charlotte Street, E.C.

Cabinet for Instruments and Dressings.—We illustrate here (*Fig.* 121) a white enamelled cabinet with three plate-glass shelves, having a base with eight compartments to hold antiseptic dressings. The size is 34 by 18 by 11 in. It makes a very useful and ornamental piece of furniture for a con-

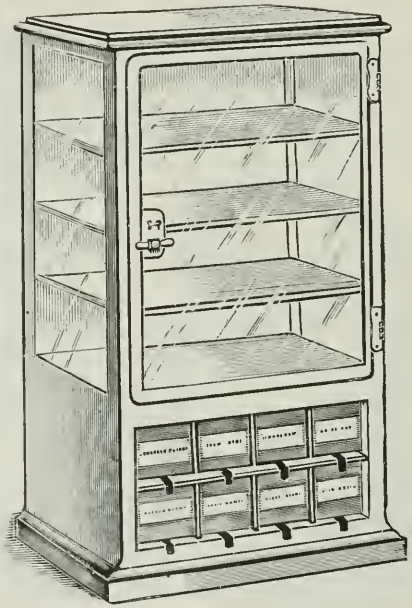

Fig. 121.

sulting-room, and much facilitates the finding of instruments and the appropriate dressing, both of which are kept under completely aseptic conditions. The cost, including a complete set of dressings, is £5. It is made by Messrs. R. Sumner & Co., Liverpool.

Chloroform Drop-bottle.—This bottle is metal cased, except for a slit up one side which shows a scale by which the exact quantity of chloroform used can be at once ascertained. It is closed by a metal screw stopper, attached to which is a small metal spout. This, when turned in one direction, makes an absolutely air-tight bottle; when in another it serves as a drop-bottle by which the chloroform is administered. We have carefully tested it, and can find nothing that can possibly get out of order. It appears to us a most perfect

appliance for the purpose for which it is intended, and is, of course, equally useful for administering A.C.E. mixture by the open method. It is supplied by Messrs. Ferris & Co., of Bristol.

Colostomy Tube.—The illustration (*Fig.* 122) shows the form of instrument made by Messrs. Down Bros for Surgeon Vaughan, R.N., who thus describes the method of using the tube. A purse-string suture is run in the wall of the intestine which requires opening, and drawn tight over the lower end of the tube, the ends being tied and again bound round the end of the intestine and tube. The wound is then closed and dressed, after which the tube is gently raised, the stopper removed, a knife or cautery inserted, and the intestinal wall incised (being steadied by a sharp hook if necessary). There is no hæmorrhage, as it is controlled by the ligature surrounding the bowel and tube. In this way absolute asepsis is preserved until after the wound is dressed and the tube fixed.

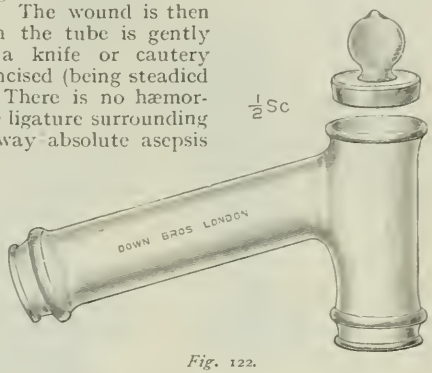

Fig. 122.

Conversation Tubes. — A conversation tube for deaf persons which is more efficient than the ordinary appliance, and can yet be packed into a neat leather pouch and carried in the pocket, is a distinct advantage, and this is possessed by the "Phonette," which is supplied by The Medical Supply Association, Gray's Inn Road, W.C. It is made entirely of metal, and the speaking end has the mechanism of the "ear trumpet" in miniature. We have carefully tested the appliance, and we have no hesitation in saying that when a patient is sufficiently deaf to require a conversation tube, there is no better or more convenient appliance yet invented.

Messrs. Ferris & Co., of Bristol, also send us a pocket conversation tube which is constructed upon the same principles and has the same advantages. We feel sure that any of our readers who bring this appliance before the notice of deaf patients will earn their regard.

Douche Can (Portable).—This is just the kind of appliance we have been wanting for some time. It is a douche can (*Fig.* 123) made on the telescopic

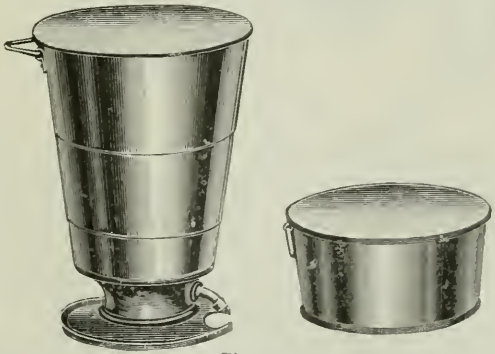
Fig. 123.

principle, and of aluminium. When pulled out it holds about a quart of fluid; when closed it occupies less space than an ordinary enema syringe in

a box, and weighs no more. For the surgical bag it is invaluable, and for ladies who have to carry such an appliance about with them it will be a great boon. Without rubber tubing and fittings it costs 5/– from Messrs. R. Sumner & Co., of Liverpool.

Douche Bath.—Messrs. Ferris & Co., of Bristol, have sent us an enamelled iron douche bath which will prove invaluable for the administration of douches in bed. It is practically a square half-covered tray. The patient's buttocks rest upon the cover, and the fluid injected flows naturally into the tray, which will hold sufficient for a large injection. Nothing better can be devised, and there are many who will be glad to know of such an appliance.

Evacuator for Litholapaxy.—Most evacuating bottles used in the operation of litholapaxy are made with two metal collars, one fixed to the neck of the rubber reservoir, the other fixed by cement to the glass neck of the bottle. This makes it impossible to sterilize the instrument by boiling. After boiling once or twice, the cement fixing the metal collar to the glass becomes loose,

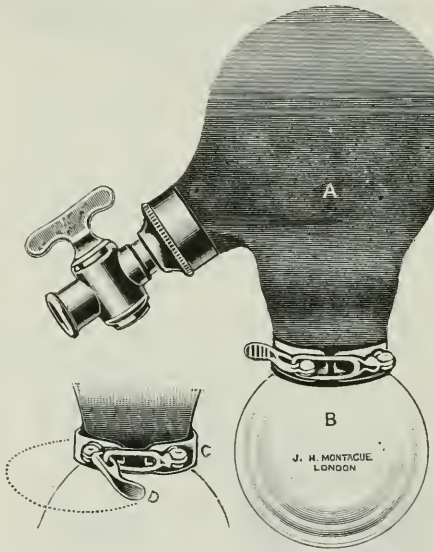

Fig. 124.

and the instrument first begins to leak, and very shortly the glass and metal come apart. Mr. John Pardoe, F.R.C.S., has therefore designed an evacuator which can be boiled again and again without this disadvantage. The accompanying illustration (*Fig.* 124) shows the method adopted. A is the rubber reservoir. B is the glass bottle. Both the rubber neck of the reservoir and the glass neck of the bottle are made very long. The rubber neck is encircled by a metal collar C which can be tightened or loosened in a moment by the little lever D. To use the instrument the lever D is pulled open, the bottle B pulled out of the rubber neck of A, the two halves are filled with sterile water, and the two halves of the instrument are now placed together again. The lever is shut, forming an impermeable joint, and the evacuator is ready for use. After a certain length of time the rubber where it is embraced by the metal collar tends to perish, but as the

rubber neck is very long, it is only necessary to cut off the perished portion. This, in use, has proved a very practical and durable apparatus. It is made by Mr. J. H. Montague, 69, New Bond Street, W.

Eyelid Retractor.—Dr. Hertzell has designed a new eyelid retractor (*Fig.* 125), the advantage of which is that the eyelid can be retracted with one hand,

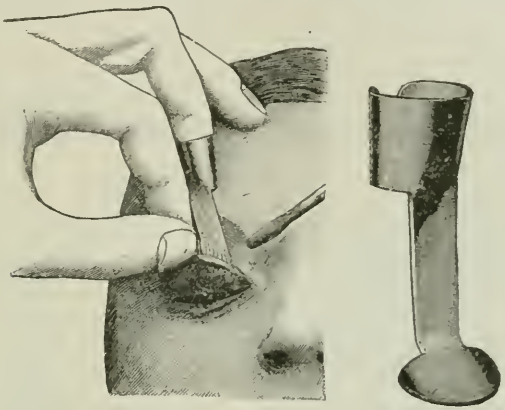

Fig. 125.

leaving the other free for holding the brush or instrument. It is simple and efficient, and we have found it very useful in practice. The Medical Supply Association, Gray's Inn Road, W.C.

Gastric Juice Extractor.—" Senoran's " gastric juice extractor (*Fig.* 126) consists of a glass graduated to 150 c.c. with a rubber suction bulb. The bottle has a tubular outfit with a lateral hole in its neck. The tube, having been passed into the stomach, is attached to the bottle. The indiarubber bulb being compressed, the air escapes through the hole in the bottle. The hole being closed with the finger, suction is produced, and the gastric juice is extracted. This can be repeated several times until a sufficient quantity has been obtained. The instrument is made by Messrs. Philip Harris & Co. Ltd., of Birmingham.

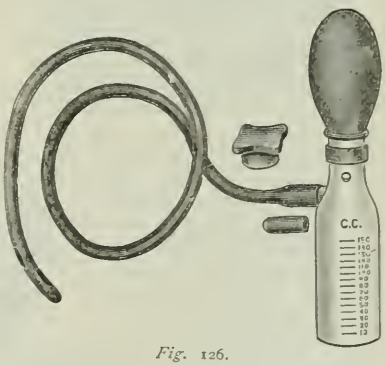

Fig. 126.

Gastroscope.—Messrs. Mayer and Meltzer have produced a new " Gastroscope " which combines both direct and indirect vision. It is a very elaborate and effective instrument, devised by Drs. William Hill and George Herschell. Particulars of this appliance, with accessories, can be obtained on application, either from the above, or Messrs. Allen & Hanburys, Wigmore Street, W.

Heating.—Messrs. Mansfield & Sons Ltd., 20, Hamilton Square, Birkenhead, have supplied an oil-gas apparatus to many laboratories where no supply of coal gas is available. It has been found equally useful where a low constant temperature is required, and in metallurgical laboratories where temperatures

as high as 1500° C. are necessary. The apparatus is simple and economical in use, and we think that those who require a reliable source of heat could not do better than apply to the firm for fuller particulars.

Hysterectomy (Vaginal Guide for).—In view of the experience that it is often of value, when performing total hysterectomy, to be able accurately to define the limits of the vagina, Mr. P. Clennell Fenwick, M.D., F.R.C.S., of Christchurch, New Zealand, has had made for him by Messrs. Down Bros.

Fig. 127.

the instrument shown in the above illustration (*Fig.* 127). A straight handle, 10 inches in length, carries at one end a flat piece slightly curved like the end of a duckbill speculum, which fits the vaginal fornix. After cleansing the vagina, this is introduced into the anterior fornix. When the broad ligaments have been ligatured and divided, the nurse or third assistant pushes the instrument upwards, and the vaginal limits are at once well defined. After ligaturing the uterine arteries the anterior vaginal wall is divided upon the flat surface, this giving a firm base upon which to cut. The assistant then turns the instrument into the posterior fornix, and the posterior vaginal wall is similarly defined and divided. Dr. Fenwick has found this also shortens the time expended in determining what extent of tissue to remove. It is equally useful with the cautery, as the metal plate allows one to burn through the vaginal wall knowing that no underlying parts will be injured.

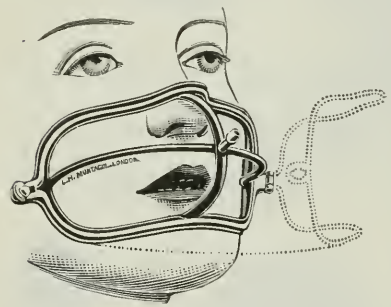

Fig. 128.

Inhalers and Sprays.—*Chloroform Inhaler.*—We thought that the last word had been said respecting frames for administering anæsthetics by the open method, but it will be seen from the illustration (*Fig.* 128) that a frame designed by Dr. E. V. Dunkley adapts itself to the face much better than those of the ordinary pattern. It covers the mouth and nose more completely and yet leaves less of the face out of observation. It is made by Mr. J. H. Montague, of 69, New Bond Street, London, W.

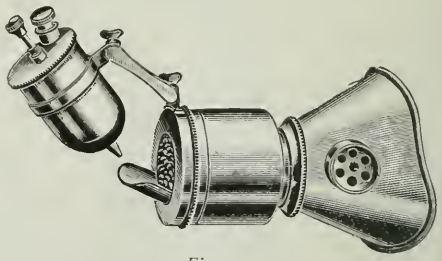

Fig. 129.

Automatic Inhaler.—We illustrate here (*Fig.* 129) a new form of open inhaler, which is provided with an automatic drop-bottle, by which the flow of the anæsthetic can be exactly regulated. It is supplied by The Medical Supply Association, Gray's Inn Road, W.C.

The Pocket Aerizer.—This has been designed to meet the requirements of those who desire to carry an aerizer in the pocket, so that it may be used at odd moments during the day. A sufficient quantity of the inhalant is poured into the bottle, and then, by repeatedly squeezing the rubber bulb sharply, the vapour may be inhaled. The fluid need not be removed from the bottle after use. This is manufactured by Messrs. Oppenheimer, Son & Co. Ltd., Victoria Street, E.C.

Pipe Inhaler.—The Medical Supply Association send us an inhaling pipe for the administration of medicinal vapours. One of the advantages claimed for this pipe, is that the vapours can be administered in a warm condition by blowing several times through the apparatus before the vapour is inhaled. This may be increased by enclosing the pipe, during use, with the hand, and utilizing the warmth radiated by the latter to take off the chill of the vapour. The construction of the apparatus will be readily seen from the illustration (*Fig.* 130).

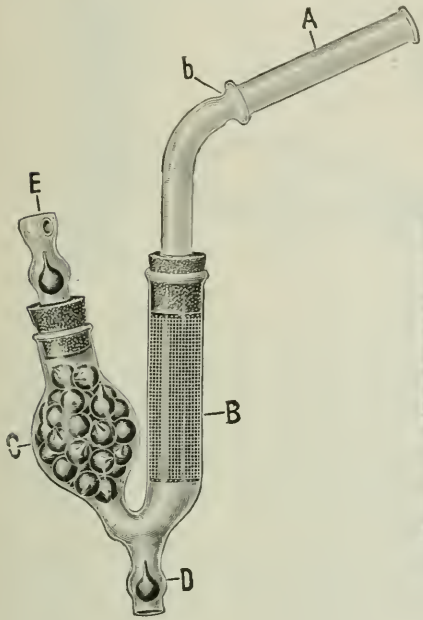

Fig. 130.

Fig. 131.

The "Ammochlorique."—This is the latest design for a chloride of ammonia inhaler (*Fig.* 131). It occupies a very small space, so that it can be carried in the pocket, which can be done safely, because the acid of ammonia is put up in ampoules. It is manufactured by Messrs. C. J. Hewlett & Son Ltd., Charlotte Street, E.C., and costs 4/6 complete.

"Crystal" Nebulizer.—By means of this simple and convenient apparatus a very fine spray can be thrown into the nose or throat; oily, glycerinated, or balsamic solutions may be used with it. Mr Frank A. Rogers, 327, Oxford Street, W., sends us this (*Fig.* 132).

Fig. 132.

"Glaseptic" Nebulizer Attachments.—The nebulizer of Messrs. Parke, Davis & Co. is well known, so that the accompanying figures of divers new attachments are likely to be of interest to the profession (*Fig.* 133).

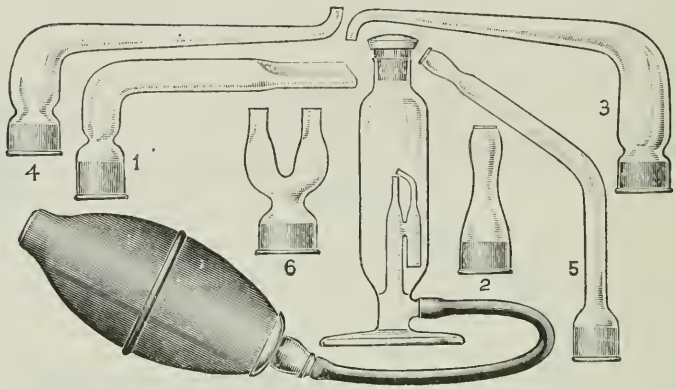

Fig. 133.

(1) Throat tube; (2) Children's nasal piece; (3) Laryngeal tube; (4) Post-nasal tube; (5) Long nasal tube; (6) Double nasal piece.

The "Super-Nebulique."—We have carefully examined the latest specimen of an aseptic spray (*Fig.* 134) which has been produced by Messrs. C. J. Hewlett & Son Ltd., of Charlotte Street, E.C. It performs its work remarkably well, and we can see no defect likely to arise while in use. The working part of the spray is entirely of glass. It can be held conveniently in the hand, and is equally efficient for both oils and aqueous or spiritous solutions. It can also be used when very small quantities of fluid are required. It appears to us a thoroughly efficient apparatus.

Fig. 134.

Throat Spray (Platinol).—Dr. Macnaughton Jones has designed a throat spray, the mounts of which are lined with platinum, which renders them entirely proof against corrosion by any medicament which may be employed. This, as all who use such appliances will know, is a great advantage. It is supplied with two nozzles, one straight and the other curved. Also two containers are supplied, the one for large quantities of the solutions which are used, as for irrigation; and the other for small quantities, such as cocaine, etc. The apparatus is well made, and should prove very reliable. It is manufactured by Messrs. Oppenheimer, Son & Co. Ltd., London.

Oxygen Inhaler.—This has been designed by Prof. Leonard Hill for giving warm and moist oxygen, or oxygen and alcoholic vapour, or other vapours combined with oxygen. The usual method of giving oxygen through a small nozzle is inefficient. By the use of this special mask 70 per cent of oxygen may be obtained with comfort to the patient. The Mask (A) (*Fig.* 135) consists of a transparent celluloid facepiece fitted with a hollow handle and a curtain of washable material which drops lightly on to the forehead and sides of the patient's face. The oxygen tube (B) is attached

to the handle, and the current of oxygen passes in through the handle and blows over the mouth and nose of the patient. The nurse holding the mask by the handle can watch the patient's face. The mask can be withdrawn or lightly replaced as needed. The patient inspires the atmosphere confined

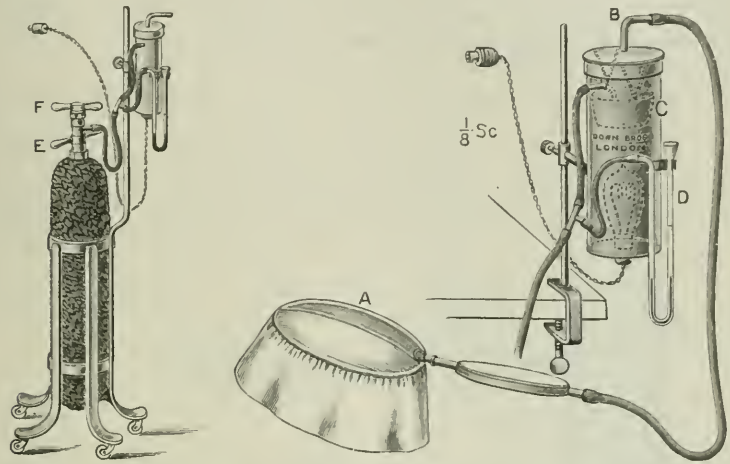

Fig. 135.

under the mask, and as a current is used sufficient to blow away the exhaled carbon dioxide, a very high percentage of oxygen is breathed in. In order to moisten and warm the oxygen gas, which issues from the cylinder dry and cold, a heating box (C) is used. By means of this also, alcohol vapour (or any other vapour for inhalation) can be given combined with oxygen. Attached to the heating box by a clip is a water manometer (D), which is put in connection with the inlet tube by means of a T tube. The addition of the gas regulator (E) is recommended to guard against the inconvenience of the water in the manometer being accidentally blown out. It is made by Messrs. Down Bros. Ltd., London.

Injections (*See also* SYRINGES and SALVARSAN APPARATUS).

Apparatus for maintaining Temperature of Injections. — The need of some apparatus which will prevent solutions cooling down during the process of injection or irrigation is a very real one. Mr. Arthur J. Evans, F.R.C.S., of Liverpool, has solved this problem by using the principle of Dewar's "Vacuum" flask (*Fig.* 136). The inner portion (having a capacity of 500 c.cm.) is separated from the outer by a vacuum. Warm fluid allowed to stand in the flask loses only 3° F. in half an hour, so that in the ordinary time taken to administer the drug only 1° is lost. The solution is strained through sterile gauze into the flask, and the upper end is plugged with gauze or wool. The flow may be controlled by a clip on the tubing attached

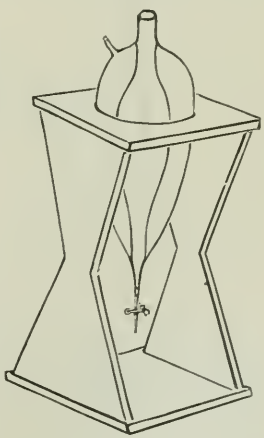

Fig. 136.

to its exit. The flask is kept sterile by being filled with alcohol when not in use. The apparatus is adaptable for any purpose in which it is necessary to introduce warm fluids into the body via the veins, tissues, or rectum. In employing the flask for the continuous introduction of saline into the rectum according to Murphy's method for peritonitis, it is only necessary to refill it every half-hour, thus doing away with the cumbrous method of keeping the solution warm by means of spirit lamps, water baths, etc. The apparatus is made by Messrs. R. Sumner & Co., of Liverpool, and we expect that it will be widely welcomed by the profession.

The principle of the vacuum flask has also been adopted in the *Universal Saline Infusion Apparatus,* introduced by The Holborn Surgical Instrument Co., at the suggestion of Mr. N. Stuart Carruthers, M.R.C.S. This consists of a quart-sized vacuum flask (*Fig.* 137), which is furnished with a water gauge, so that the exact quantity of fluid injected is clearly shown. The rapidity of the flow is regulated by the taps at the base of the needles, two being usually employed. This apparatus is excellently made and very practical, and costs only 35/–.

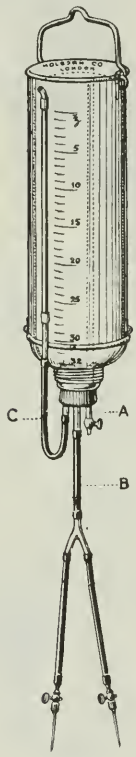

Fig. 137.

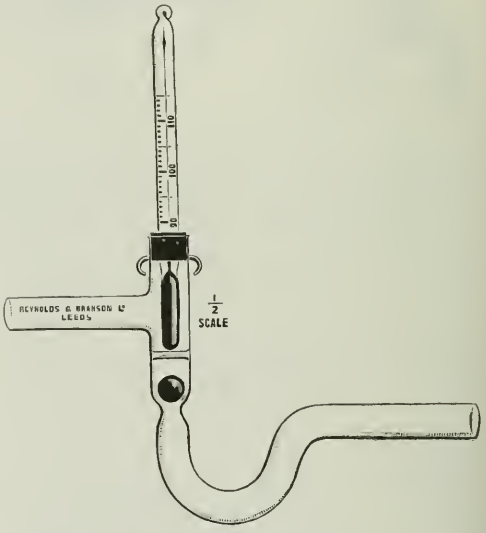

Fig. 138.

Saline Indicator and Thermometer.—The apparatus in the accompanying illustration (*Fig.* 138) has been designed by Mr. Norbert Reader, M.B., B.S., for registering the temperature of saline just before it enters the body, either subcutaneously or by the rectum. In the course of transit through a long rubber tube a stream of hot saline cools down very rapidly. With this apparatus the temperature of the fluid can be checked just before it is introduced. The apparatus also indicates whether the saline is flowing or not. This is done by means of a bead suspended in the fluid. As long as the saline continues to flow, the bead remains pressed up against a glass rod fixed across the glass tubing. As soon as the flow stops the bead falls down into a cup-

shaped receptacle. The bead is a very delicate indicator, and will demonstrate clearly a very small rate of flow. The apparatus has the advantage that *no air* is present within it; the whole of the interior should be filled with saline, and care should be taken that no air bubbles are allowed to remain. The appliance can be fitted to any of the devices that are used for administering hot fluid through a rubber tube, whether this be into the tissues or into the rectum. It is important that only a short length of rubber tubing should intervene between the distal end of the glass tubing and the infusion needle or the rectal tube, as the case may be. Two small projections enable the appliance to be hung up in any position that may be most convenient. This useful apparatus is made by Messrs. Reynolds & Branson Ltd., Leeds.

Drop Regulator.—With all the existing forms of continuous infusion and proctoclysis apparatus, there is a certain amount of difficulty in regulating the flow of the saline fluid. To overcome this, Messrs. Allen & Hanburys Ltd., have made, to the instruction of Dr. E. Canny Ryall, a simple drop

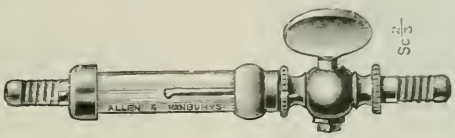

Fig. 139.

regulator (*Fig.* 139). The barrel is made of glass, and has nickel-plated metal mounts at either end for attaching the indiarubber tubing. Any required number of drops may be administered during a given period, altering the rate of flow, if necessary, by the use of the stopcock.

Instrument Holder.—A simple, but very convenient arrangement (*Fig.* 140) for holding surgical instruments, has been made by The Holborn Surgical

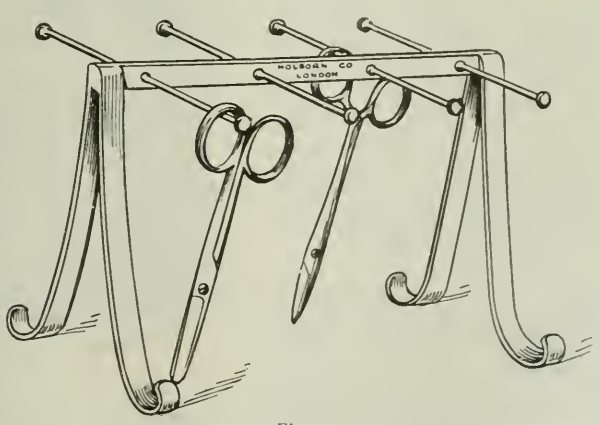

Fig. 140.

Instrument Co., 26, Thavies Inn, E.C. It is nickel-plated, and will hold a very large number of small instruments, such as scissors, forceps, etc. It is intended to stand on the glass shelf in a surgical cabinet.

Lamp (Electric).—We illustrate here (*Fig.* 141) a very simple pocket diagnosis lamp produced by Messrs. Philip Harris & Co. Ltd., of Birmingham, which is very compact, and costs only 4/6. Battery refills for this lamp are supplied at 1/6 each. It is most convenient and portable, and will meet many requirements.

Fig. 141.

Masks (Protective). — Mr. Seymour Jones has designed a protective mask for the face, which may be used to ensure against infection in the oral and laryngeal examinations of patients suspected of tubercle, diphtheria, etc., and also to enable the operator to make topical applications, and operate on the nose and throat, without having to dodge sudden and involuntary expectorations of the patient. It consists of a spectacle frame with lateral projections; from this is suspended a curtain of waterproof material. The arrangement of the appliance will be readily understood from the illustration (*Fig.* 142). It is manufactured by Messrs. Philip Harris & Co. Ltd., of Birmingham.

Fig. 142.

Messrs. R. Sumner & Co., of Liverpool, send us a very ingenious arrangement which is intended either as a protective mask for persons employed in trades where the inhalation of dust would be dangerous to health, or as an inhaler of medicated vapours. It consists of two pieces of aluminium gauze, so shaped as to fit the mouth and nose. Between these, when laid one upon the other, a piece of lint or porous material is placed. This arrangement is very light to wear, and is a perfect protection against dust or smoke particles. It occurs to us that it would be very efficient for firemen to wear when working in dense smoke. If any light oil is placed upon the lint, the appliance is very suitable for the administration of vapours in lung or throat affections.

Fig. 143.

Metal Receiver with Cover. — Messrs. R. Sumner and Co., of Liverpool, have sent us a white enamelled bowl with cover, which appears to us a cheap and useful appliance for many surgical purposes (*Fig.* 143). It can be used as a receiver, or to hold antiseptic dressings until required for use, the cover preventing them being exposed to the air or dust. We have

found this very useful as a receiver in the consulting room, as the soiled swabs can be concealed before the next patient is admitted. It is 8 in. in diameter, and costs 2/6.

Mouth Gag and Tongue Depressor.—This is constructed on the principle of the Gosset gag, but has a flange arrangement on the lower hook, so that, when it is applied, the surgeon is enabled to pass a tongue depressor, which can be either lowered or elevated by a screw arrangement beneath (*Fig.* 144). Its special practical use is that both hands of the surgeon are left free, and operative measures are facilitated. Two tongue depressors are supplied with each apparatus to meet the needs of children and adults. This costs 12/6, and is supplied by Messrs. R. Sumner & Co., of Liverpool.

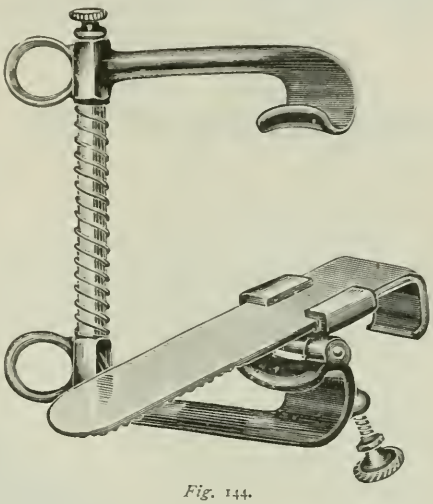

Fig. 144.

Multostat (The New).—The Sanitas Co., 61, New Cavendish Street, W., have issued a booklet dealing with the improvements which have been made in this instrument, which is so valuable to those who have a supply of electricity in their consulting-rooms. We have had one in daily use for some years, and can testify to the enormous advantage of being able to administer galvanic and faradic currents with one instrument, and also use the same for light or cautery, or for any purpose requiring an electric motor. We have never regretted the purchase.

Nasal Dilator.—Dr. Alexander Francis has designed a new dilator for the alæ nasi, which we illustrate here (*Fig.* 145). It is easily inserted, and gives a clear vision. It is made by The Medical Supply Association, Gray's Inn Road, W.C.

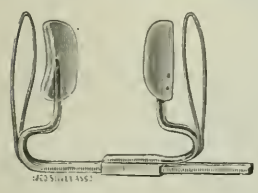

Fig. 145.

Fig. 146.

Nasal Pipette.—This apparatus (*Fig.* 146), supplied by Mr. Frank A. Rogers, 327, Oxford Street, W., has the merit of simplicity combined with efficiency. Tablets for the preparation of a saline nasal lotion are also sold by the maker

Nasal Snare (Glegg's).—This snare is so arranged that by pressure upon the trigger the loop can be either advanced or retracted, and it is thus always under control with one hand. The advantage of this in nasal operations is self-evident. It has also other practical advantages which make it *distinctly superior* to any nasal snare we have used. Our only regret is that we did not know of it before. It can be obtained from Messrs. Ferris & Co., Bristol.

Needles and Holders.—We illustrate (*Fig.* 147) "Paterson's Improved Eye" for surgical needles. It will be observed that the eye is prolonged to the end of the needle, the sides gradually converging. The result is, that when in use, the ligature is firmly gripped, and cannot slip out. It has been found very useful for continuous suture. It can be adapted to any shape of needle. Messrs. Philip Harris & Co., Birmingham.

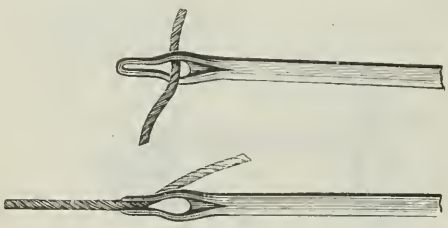

Fig. 147.

Dr. Lynn Thomas's Needle also has a patent eye, the advantage of which is the simplicity and rapidity with which it can be threaded. These needles are supplied by The Holborn Surgical Instrument Co. Ltd., 26, Thavies Inn, E.C.

Needle Threaders.—Messrs. Ferris & Co., of Bristol, have produced some needle threaders for catgut and silk, which are intended to facilitate the threading of needles at an operation. Both gut and silk fray out at the ends on trying to pass them through the eye of the needle, but with the threaders a loop can be drawn through readily. They cost 2/6 per packet.

The "Bozemann's" Needle Holder, which we show here (*Fig.* 148), is, owing to its length and shape, particularly adapted to deep pelvic sutures, while,

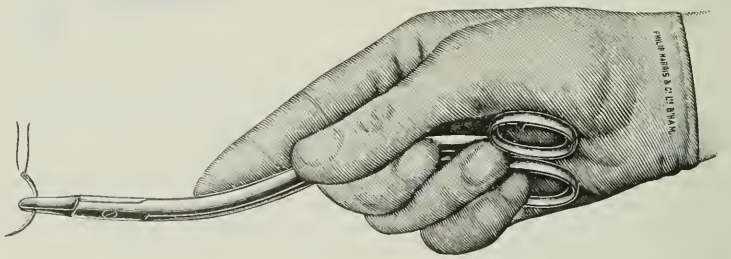

Fig. 148.

when held as shown in the illustration, it is equally adapted for suturing the more superficial structures, such as the abdominal wall. Messrs. Philip Harris & Co., Birmingham.

Needle Sharpener.—The "Arkansas Slip" is a useful little stone for sharpening the points of needles which have become blunted. A drop of oil is put on the stone, and the point of the needle is rubbed up and down lengthways on the convex side of the stone, and a sharp point to the needle is obtained. The cost of these is 1/– each, from The Holborn Surgical Instrument Co., London.

Operating Table (Portable).—Mr. Bernard J. Ward, F.R.C.S., has designed a portable metal operating-table, which may be regarded as quite a new model (*Figs.* 149, 150). It is made of seamless steel tubing, with a highly polished aluminium top, and is designed to give perfect horizontal lithotomy and Trendelenburg positions. Its weight is under 60 lb., and it folds up into a space of 32 × 20 × 6 inches. It has a sliding head-rest, which can be adjusted to any angle, and may be used in the usual position at the end of the table,

or slid half way down to support the head and shoulders in the lithotomy position. It costs 12 guineas complete, and is manufactured by Messrs. Philip Harris & Co. Ltd., of Birmingham.

Fig. 149.

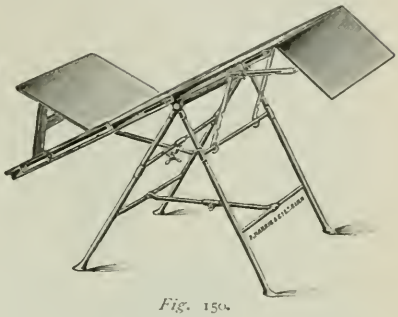

Fig. 150.

Probe (Playfair's).—Messrs. Ferris & Co., of Bristol, send us a Playfair's probe with three aluminium ends which are interchangeable. The spare probes are kept in the end of the handle. They are flexible, and can be bent to any desired angle. The utility of the appliance is obvious. The probes can be readily unscrewed and a fresh one attached, while the space occupied is that of a single probe.

Quinine Injection Pocket Case.—Messrs. Burroughs Wellcome & Co. have produced an outfit which comprises everything necessary for administration of quinine by hypodermic or intramuscular injection. The "Tabloid" quinine injection pocket case is very compact and complete. Within a nickel-plated metal case, so small as to be easily slipped into the

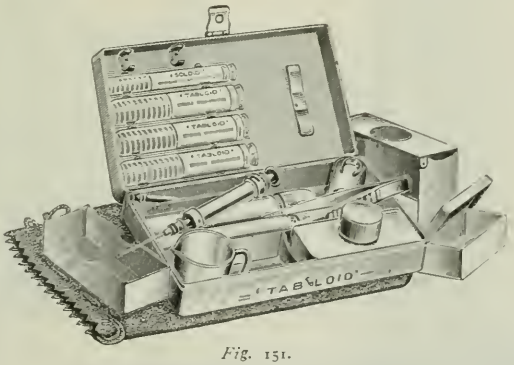

Fig. 151.

pocket, are contained a 20-min. all-metal syringe with needles, a supply of "Tabloid" hypodermic quinine bihydrochloride, a pair of forceps, "Soloid" corrosive sublimate for the preparation of the patient's skin, and all the apparatus—including a sterilizing cup and tray, a spirit lamp, and even a match box—required for the sterilization of the syringe and the quinine solutions (*Fig.* 151).

Salvarsan Apparatus.—Much attention has been directed by the manufacturers to the production of suitable apparatus for the administration of salvarsan. At the present moment intravenous injections are preferred to

intramuscular, because the latter have frequently caused irritation and sometimes necrosis of the tissues. It occurs to us that some practitioners will have their doubts whether a fluid likely to do this is altogether safe to inject into the veins, in spite of the fact that it becomes greatly diluted by doing so. It is also questionable whether further experience will not show that instead of trying to abort a profound constitutional disease by a single injection, it will not be better to spread the dose over several injections, each given in such a dilute form that the intramuscular method would be quite safe.

Another point is whether the injection should be given by means of a syringe or by gravitation. From correspondence we have received, we are sure that many practitioners are not aware how easily 50 to 100 c.c. can be injected intramuscularly with a syringe and long needle. The tissues just above the trochanter are the most convenient site. Whichever method the practitioner may adopt, he will find ample provision made for him by the surgical manufacturers.

We illustrate here (*Fig.* 152) an apparatus made by Messrs. Reynolds & Branson, of Leeds, by which the gravitation method may be used, the fluid being kept warm by hot water in the outer vessel in which the receiver is placed. For other means of keeping fluid warm when used for irrigation or injection, see paragraph "Injections," (*page* 635).

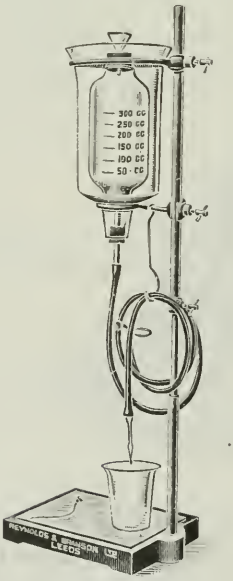

Fig. 152.

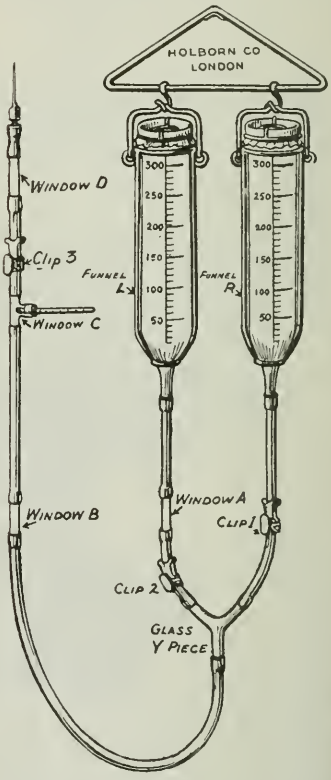

Fig. 153.

The Holborn Surgical Instrument Co. supply an apparatus (*Fig.* 153), for administering by gravitation, which has two funnels of 300 c.c. capacity, one for the salvarsan solution and the other for saline solution. These are joined by a Y-piece, and the admission of both fluids can be controlled at will by suitable clips before they meet. These funnels are enclosed in a suitable wire cage, so that they can be hung up when in use.

Messrs. Reynolds & Branson, of Leeds, have brought out a complete apparatus (*Fig.* 154), including sterilizer, etc., which supplies everything required both for preparing and injecting the salvarsan solution. It contains a 40 c.c. all-glass syringe. They will supply any part of this set separately

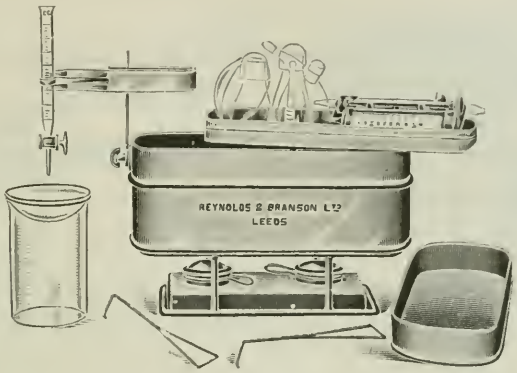

Fig. 154.

if required. Every possible detail has been worked out in this firm's usual clever manner. They have simplified the technique by preparing an ampoule containing 100 c.c. of sodium hydrate solution. This obviates the necessity of carrying the bottle and sterilizing flask.

The Medical Supply Association also introduce a complete apparatus (*Fig.* 155) for salvarsan injection under the name of the "Grevillite." This is

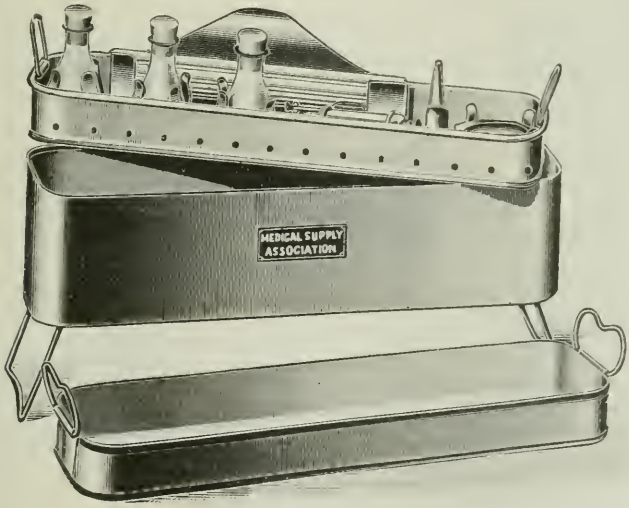

Fig. 155.

intended for intramuscular injections, and contains all the necessary appliances for preparing the injection, and also a sterilizer.

Messrs. Allen & Hanburys Ltd. have made a syringe (*Fig.* 156), especially adapted for intravenous injection, at the suggestion of Mr. J. E. R. McDonagh, F.R.C.S. The syringe is all glass, with a capacity of 20 c.c., and is fitted

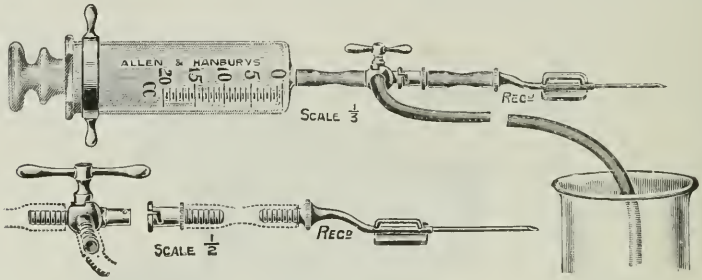

Fig. 156.

with a three-way stop-cock. Its construction is well shown by the illustration. A pamphlet giving full details of the method of administration is supplied by the manufacturers.

Sanitary Cleaner.—Under the name of the Wyandotte Sanitary Cleaner and Cleanser, The Medical Supply Association, Gray's Inn Road, W.C., supply a white powder in $3\frac{1}{2}$-lb. bags at the cost of a shilling. This powder does not lather, nor owe anything to mechanical friction, because it is partially soluble, but it cleans, in a most efficacious manner, greasy surfaces and soiled paint. It precipitates the lime in water, and renders it soft. It has no caustic action. It appears to supply a real need in our general cleansing arrangements, and should have a large sale, as it is very cheap, and facilitates the cleansing of almost any article in a most marvellous manner. We can recommend its use both in hospitals and private houses.

Speculum (Rectal).—The rectal specula at present in use almost invariably cause pain during the act of withdrawal, especially in the case of piles, which become caught in the sharp-edged slit. Dr. James Searson has designed a speculum by which this difficulty is overcome. As shown in the illustration (*Fig.* 157), this speculum is cone-shaped, with a sliding piece, which on partial

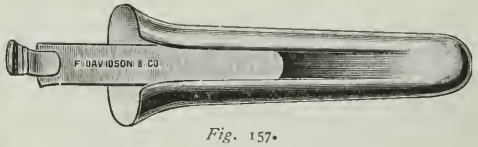

Fig. 157.

withdrawal causes the piles in the exposed area to appear. The slope in the wall of the speculum is very gradual, with smooth and rounded edges. The sharp and more or less cutting edges peculiar to the old form are avoided, so that the withdrawal of the instrument is quite easy and painless. We have used this speculum in a large number of cases where, owing to the presence of hæmorrhoids, fissure, etc., the passage of an ordinary rectal speculum would have been very painful. The result is so satisfactory that we are convinced that no practitioner who has once used Dr. Searson's clever invention would care to employ the ordinary kind. It is distinctly a practical advance which overcomes a previously unsolved difficulty. Messrs. F. Davidson & Co., Great Portland Street, are the manufacturers.

Mr. Lockhart Mummery's Anal Speculum has all its edges most carefully rounded, which allows it to be rotated when in use. It is supplied, fitted with handle or without, by The Medical Supply Association, Gray's Inn Road, W.C.

Speculum (Vaginal).—Dr. C. Hubert Roberts has designed an improved form of Sims's vaginal speculum (*Fig.* 158) by adding a flange-like projection to the upper blade, which is of considerable assistance when examining patients in the left lateral position. The flang lifts up the right buttock when the

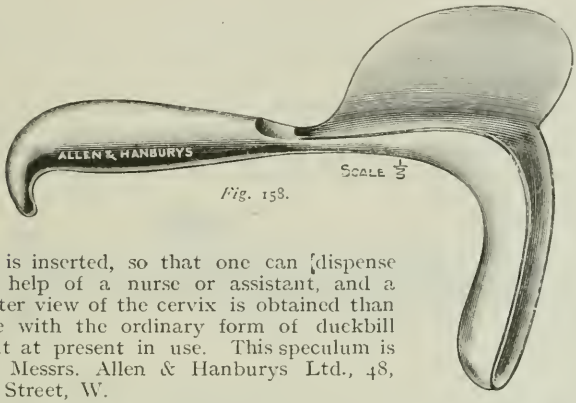

Fig. 158.

speculum is inserted, so that one can dispense with the help of a nurse or assistant, and a much better view of the cervix is obtained than is possible with the ordinary form of duckbill instrument at present in use. This speculum is made by Messrs. Allen & Hanburys Ltd., 48, Wigmore Street, W.

Spittoons.—Mr. W. Martindale, of 10, New Cavendish Street, W., has given great attention to the manufacture of a pocket spittoon (*Fig.* 159) for tuberculous patients, and his latest production covers every possible requirement. It is of convenient size to carry in the pocket, and is so constructed that there is no chance of its contents being spilled. The method of opening and closing is simple and effectual, the catch for the lid being on the swivel principle. One important fact is, that no one seeing it would recognize its purpose.

Fig. 159.

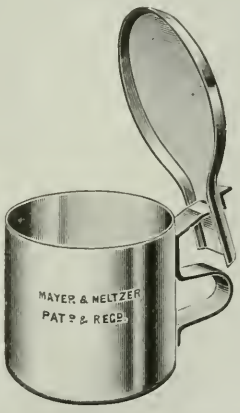

Fig. 160.

Messrs. Mayer & Meltzer have produced a spittoon-pot made of tinned iron (*Fig.* 160). It has a detachable lid which, not opening to a right-angle, is self-closing. It is intended for use in the wards of sanatoria, and is cheap and efficient for this purpose. It would be improved by some simple device to check the noise of the lid as it falls back after use. This should not be difficult.

Sphygmomanometers.—One of the disadvantages of this instrument is the frequent loss of the rubber caps, and the consequent spilling of the mercury. Messrs. Hawksley & Sons, 357, Oxford Street, W., have designed a non-spillable manometer tube which obviates the difficulty. No rubber cap is necessary, and the mercury cannot escape. This can be fitted to the older instruments.

The Medical Supply Association, Gray's Inn Road, W.C., have also sent us particulars of the "*Claude*" *Sphygmomanometer*, which claims that the mercury cannot be spilled.

Staple Holder and Punch (Combined).—In performing Roux's operation for femoral hernia it is found that the staple cannot be easily controlled and fixed in position before being driven home. This is particularly noticeable in stout patients with a patulous femoral ring. The clamp punch designed by

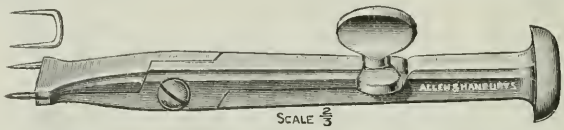

Fig. 161.

Mr. C. M. Page, M.S., renders the staple perfectly manageable during the process of pinning the ligament, and is then used as a punch, being removed when the staple has been driven home. The illustration (*Fig.* 161) clearly shows the detail of the instrument, which is made by Messrs. Allen & Hanburys Ltd., 48, Wigmore Street, W.

Sterilized Dressings.—Mr. W. Martindale has, for the convenience of the profession, arranged a series of sterilized dressings, ready for use in cases of operation (*Fig.* 162). His "Abdominal" set contains two dozen large swabs,

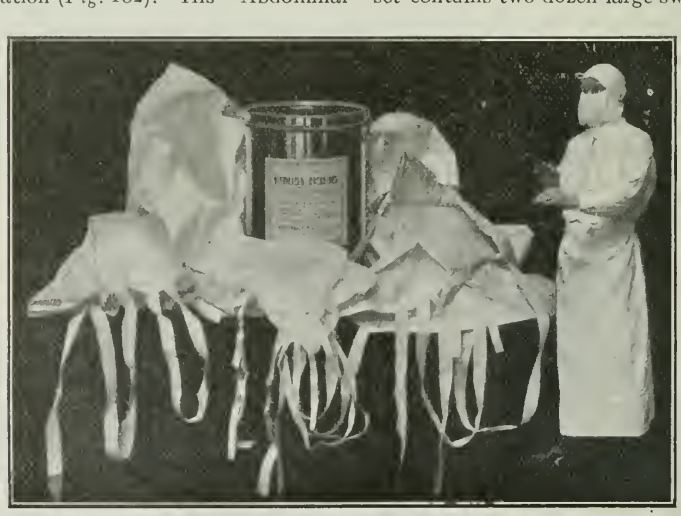

Fig. 162.

four towels, pads, bandage, wrapper or overall (with sleeves) large enough to cover the surgeon's clothing completely, 1 dozen gauze rolls, and a veil to cover the operator's face. The entire outfit is sent out in a sealed tin, guaranteed sterilized in an autoclave at 250° F.

Stethoscopes.—Dr. Blackwell has designed a *Binaural Stethoscope*, which he claims to be "mathematically and physically correct throughout," and in which "the intensity of sound is at least double that of the ordinary binaural instrument." We have not examined this invention, but we observe from the illustration that the old-fashioned spring is employed to keep it in contact with the ears. Messrs. Allen & Hanburys are the makers.

Dr. H. A. Haig has designed a new *Chest-piece for Binaural Stethoscopes* (*Fig.* 163), which is intended to "minimize irregular reflection of sound vibration;" although the gain in intensity of the sound at the ear is but slight, there is a marked purity of note, possibly due to a reduction of the higher harmonics and a preservation of the fundamental tone, consequent upon diminished interference of vibrations. We have had no opportunity of testing the appliance. It is made by Messrs. Mayer & Meltzer.

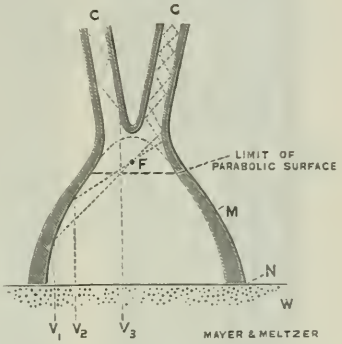

Fig. 163.

Messrs. Ferris & Co., of Bristol, send us a new *Binaural Stethoscope*, in which the spring for holding the ear-pieces in contact with the ear is replaced by a locking joint, which fixes the ear-piece when the exact pressure is made. This is a great improvement upon the spring, and will be liked by those who have not accustomed themselves to flexible tubes which retain their position without mechanical aid.

Under the name of the "*Stethophone*" The Medical Supply Association have introduced a new chest-piece (*Fig.* 164), which is somewhat on the lines of the phonendoscope, and which accentuates sound. It is fitted up on the line of a binaural stethoscope. We think the instrument could be made more portable if constructed of metal and furnished with flexible tubing. Vulcanite, when constantly unscrewed to make the instrument more portable, would soon wear out.

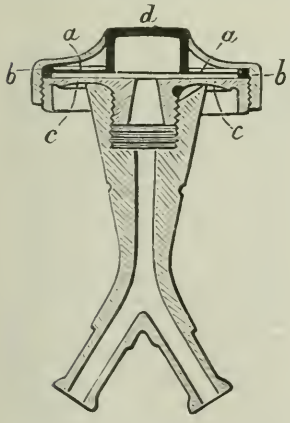

Fig. 164.

The same firm have also adapted the "*Phonette*" conversation tube, which we have noticed (*see* "Conversation Tubes") to a *Monaural Stethoscope*. As the mouth-piece of the "Phonette" is practically a miniature ear-trumpet, and increases sound so that the deaf can hear, its great possibilities at once suggested themselves to us. We do not like a monaural stethoscope, for obvious reasons, but we connected the mouth-piece of the "Phonette" to a Y-shaped tube, furnished this with two india-rubber tubes and ear-pieces, and as a result found ourselves in possession of the most perfect stethoscope we have ever used. It is much more powerful than the phonendoscope, and occupies very little space in the pocket. We think it will prove the most popular instrument for auscultation yet produced.

Surgical Pocket Case.—Messrs. R. Sumner & Co., of Liverpool, supply a metal case containing two trays, which carry a finger knife, Syme's knife, blunt bistoury, hook, double scoop, dressing and artery forceps, spatula, scissors, probes, director, and aneurysm needle. (*Fig.* 165.) The instruments

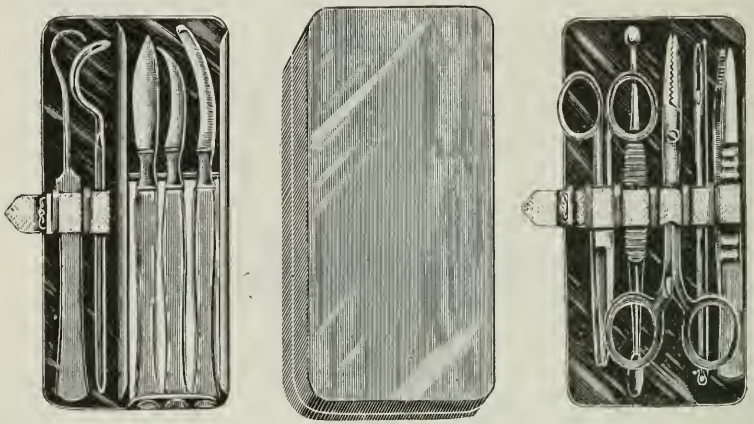

Fig. 165.

can thus be carried in the pocket, and in an absolutely aseptic condition. The whole is enclosed in an outer leather case, the price complete being 27/6. It would be difficult to find a more useful and practical surgical case for every-day practice.

Surgical Rings.—These are like key rings, and are intended to keep forceps, scissors, etc., together, while being sterilized, and to facilitate their removal. They are sold in sets of three, and cost 1/6. Messrs. R. Sumner & Co., of Liverpool, are the manufacturers.

Syringes.—*The "Leedro" Syringe* is of distinctly novel design, its intention being to allow a high-temperature vaginal injection to be given without scalding the vaginal walls. It is in such affections as metritis and inflammation of the cervix that injections at, say 130° F., are very beneficial. In this syringe (*Fig.* 166) a circular jacket covers the actual tube through which the hot water is passing, and this jacket is filled with cold water. It is made of exceedingly soft indiarubber, which will, under no circumstances, irritate the passage. The injecting pipe is furnished with an inlet and outlet, so that the water injected flows into a receptacle without soiling the bed. It is also furnished with a soft indiarubber protector, which covers its metallic mountings, so as to isolate it from the vulva. This is distinctly the best device which has yet been made for the use of high-temperature injections with the greatest amount of efficiency and comfort to the patient. It is manufactured by The "Leedro" Co., 6, Summerhill Avenue, Newport, Mon.

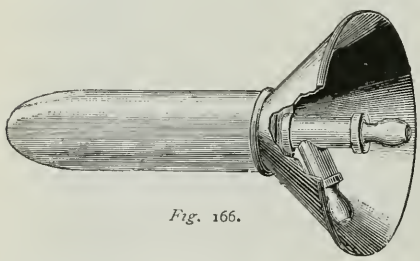

Fig. 166.

Mr. Graham Simpson, F.R.C.S., has designed a syringe (*Fig.* 167) made with a piston (*Fig.* 168) on the principle of that used in the motor-car. The piston fits the barrel of the syringe only loosely, and is made air-tight by the addition of three split metal rings, which are sprung on the piston and fit into three

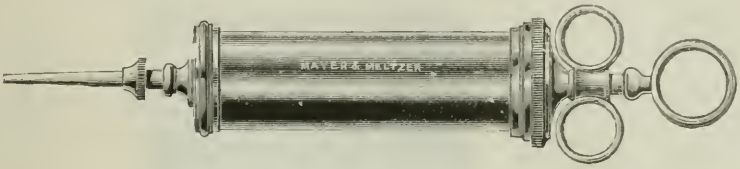

Fig. 167.

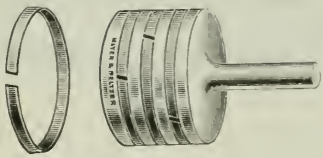

Fig. 168.

corresponding grooves. When these rings become worn they can be replaced at a small cost (3/6), and the syringe is then once more air-tight. This appears to us a solution of a common difficulty, and will prove of advantage when syringes are in constant use. Messrs. Mayer & Meltzer are the manufacturers.

Hypodermic Syringe (*The "Ideal"*).—Messrs. Oppenheimer, Sons & Co. Ltd. have produced a very convenient pocket hypodermic case, containing tubes for soluble pellets attached to the lid by means of metal clips. The syringe is furnished with an all-metal piston, ground to fit the barrel, which is made of glass. It has also a detachable nozzle, held in position by a metal screw rim, which holds it quite rigid and air-tight. We see nothing in this syringe which is easily destroyed or likely to get out of order, and we think it can always be depended upon to be ready for use when required (*Fig.* 169).

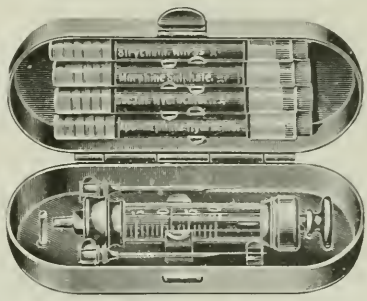

Fig. 169.

Messrs. Ferris & Co., of Bristol, have sent us a *Hypodermic Syringe* in case, with ten tubes of pellets. This appears to us the most practical emergency case that has come under our notice. First, the syringe is all that can be desired. It is of ground glass, with solid metal piston, and metal plug nose-piece. It has a metal screw-capped guard to barrel. But the point which we like is that the tubes containing the tablets and the syringe and needles are mounted upon a metal rack, which can be taken out bodily, placed upon the table, and everything got at with ease, and when finished with can be singly returned to the case. This is really a great advantage. There is too much of the Chinese puzzle about many of the fitted cases supplied to the medical profession—it is too often forgotten that most of them are in a hurry. They can use this case with satisfaction. (*See also* article "Asepsis of Instruments.")

Lieut. C. Clarke, R.A.M.C., has designed a *Magazine Hypodermic Morphia Syringe* (*Fig.* 170) for use on the field of battle, which we illustrate. It contains fifteen consecutive doses of morphia of 20 minims each. It avoids

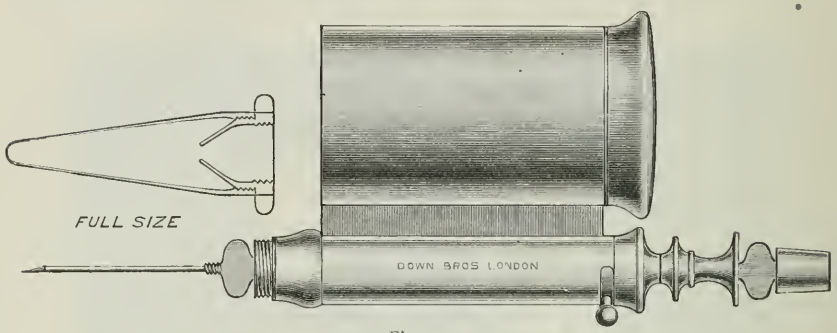

Fig. 170.

having to refill the syringe or measure the dose under conditions of difficulty. Messrs. Down Bros. Ltd., are the manufacturers.

Thermometers.—We considered that Mr. G. H. Zeal had solved the problem of resetting the index by his invention of the "Repello" thermometer, but he recognizes that nurses and others will use a cheaper form of thermometer, so that the old difficulty of resetting the index remains. He has now invented

Fig. 171.

a thermometer case (*Fig.* 171), which has a spring at one end, with a flattened end for holding between the thumb and index finger. The thermometer is simply put back into its case, and by making two or three shakes of the spring end the index is reset immediately. We have personally tested this case, and find it most efficient. They are supplied wholesale, at 8/– per dozen, by Mr. G. H. Zeal, 82, Turnmill Street, London, E.C.

Dr. A. Gordon Wilson has designed an *Aseptic Thermometer* (*Fig.* 172). It consists of a tube of toughened glass, closed at one end, and fitted at the other with a rubber stopper, to which is firmly fixed the end of the clinical thermometer. When in use the tube is half filled with an antiseptic solution, and

Fig. 172.

the thermometer being inserted becomes completely covered, so that it is continuously contained in an aseptic condition. The whole fits into a neat nickel case. The "Thermolique" thermometer is supplied at a very moderate price by Messrs. C. J. Hewlett & Son Ltd., Charlotte Street, London, E.C.

Tongue Depressor (Collin's).—In many cases anything will serve as a tongue-depressor, but when you have a high-backed tongue, and anything to do to the pharynx, a really serviceable instrument is essential. Collin's tongue depressor is an ideal instrument. There is a little hook at the end

of the handle which curls round your hand, and you can pull the tongue forward and keep it completely under control. This is distinctly the instrument for serious work. Messrs. Reynolds & Branson Ltd., of Leeds, are the manufacturers.

An improvement upon the ordinary glass tongue depressor has been effected by making one with opal glass with serrated ends. This is quite efficient for all ordinary cases, and easily kept clean. They cost 2/- each. Messrs. R. Sumner & Co., Liverpool, are the manufacturers.

Messrs. Ferris & Co. send us a *Tongue Depressor with Insufflator*, which is all glass except the rubber ball at one extremity. It is an effective instrument for applying powder to the uvula or other part with precision, and has the advantage of being easily rendered aseptic. It is of advantage also that no more powder than is required for a dose is inserted into the tube.

Tongue Clip and Junker Terminal.—We illustrate (*Fig.* 173) a combined tongue clip and Junker terminal, which Dr. G. A. H. Barton has found specially serviceable in operations upon the upper air-passages. When no traction is required on the tongue it serves to hold the terminal in place ; but if traction is necessary it can be effected by a single finger in the loop, leaving the other hand of the anæsthetist free. It is made by Messrs. Mayer & Meltzer, 71, Great Portland Street, W.

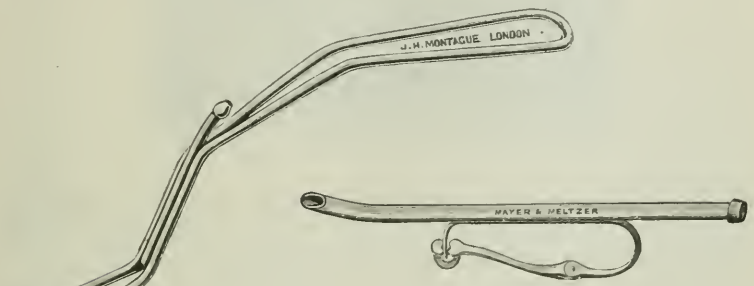

Fig. 173.

Fig. 174.

We also illustrate another instrument (*Fig.* 174) for the same purpose, devised by Mr. Fredk. Longhurst, M.R.C.S., and made by Mr. J. H. Montague, 69, New Bond Street, W.

Tonsil Instruments.—*Guillotine.*—We have received from Messrs. Reynolds & Branson, Ltd., of Leeds, an ingenious guillotine, that combines all the virtues of Mackenzie's, Heath's, and Kelson's. You have only to unscrew the handle and fix it at different angles, and you have the one or the other, and in any case the instrument best adapted for the particular patient. We are glad to observe that the foramen for the tonsil is large enough : in many instruments it is too small. The flexibility and adaptability of this appliance specially commend it.

Tonsil Lancet.—Dr. A. Campbell Stark has designed a lancet (*Fig.* 175) specially adapted for opening a peritonsillar abscess. It has a needle 6½ inches long, and terminates in a slightly curved and sharp-pointed blade, half an inch long, provided at its base with a broad flange. This instrument undoubtedly will facilitate the operation. It is manufactured by Messrs. C. J. Hewlett & Son Ltd., Charlotte Street, E.C.

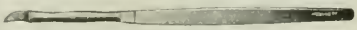

Fig. 175.

Tonsil Bistoury (*Godfrey's*).—This instrument has been designed for enucleating the tonsils. It has a well-protected end and a good curve, and is made of solid steel. There are many cases where an instrument of this sort is much more efficient than the guillotine ; and the operation is quite as safe, and no more difficult. It is made by Messrs. Reynolds & Branson, of Leeds.

Tricycle for Invalids.—Mr. Witham, who is himself dependent upon mechanical aid to locomotion, has devoted nine years to constant experiments with a view to making a hand-propelled tricycle or bath chair, which would be suitable for those who have to rely upon such appliances. In this effort he is aided by Mr. Dingwall, mechanical engineer. The machine (*Fig.* 176) is

Fig. 176.

propelled by a to-and-fro action of two propelling levers, the rider pushing one forward, while pulling the other back. It can be fitted with a two-speed gear and a free-wheel clutch, and furnished with efficient brakes. The steering is managed by simply twisting the right-hand propelling lever. A *special feature* is the two-speed and free-wheel fitted to the *Model* 3, which enable hills to be taken without undue exertion. We understand that these machines have been supplied to invalids in all parts of the country, invariably giving great satisfaction. Any of our readers who have patients requiring such an appliance would do well to write to Mr. James P. Witham, Newport, Isle of Wight, who has a booklet containing full particulars.

Truss (Coles' Spiral Spring).—Attention has been called to the fact that we have not noticed the value of the spiral spring truss (*Fig.* 177), which has now been for some years before the profession. We think that its value is so well recognized by all who have tried the various mechanisms for holding a rupture in place, that it is hardly necessary to remind the profession of Messrs. William Coles & Co.'s invention. The advantage of the truss is the spiral spring inserted in the pad, which, acting in conjunction with the main or body spring, produces not only the uniform pressure, but gives a certain elasticity, which adapts itself to the various movements of the body, while the constant support is maintained under all conditions. It is made by Messrs. Wm. Coles & Co., 5, Sackville Street, Piccadilly, W.

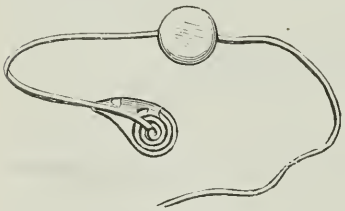

Fig. 177.

Urethral Ointment Applicator.—Mr. Andrew Charles, F.R.C.S., has designed the applicator depicted in the accompanying diagram (*Fig.* 178). By its means a large quantity of sterile ointment can be thoroughly distributed, and by massage on the instrument forced into the folds of the urethral surface and the ducts of the glands. The applicator further acts as a dilator. It consists of a metal tube with lateral slits and a solid conical screw-off end with a metal obturator fitting inside it, and a metal nozzle with universal screw to fit any ordinary collapsible tube.

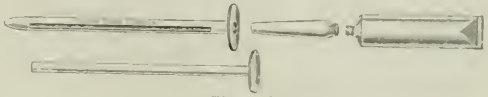

Fig. 178.

Fig. 179.

An instrument (*Fig.* 179) has also been made for Mr. Charles on the same principle for application of ointment to the rectum. The makers are Messrs. Down Bros. Ltd.

Urinary Analysis.—The Endolytic Tube Co., Hampton-on-Thames, have brought out some capillary glass tubes charged with reagents for the clinical examination of urine. For albumin they contain salicyl-sulphonic acid; for sugar, Fehling's solution. In testing for albumin, the ends being broken off the capillary tube, and the fluid extents being brought down to one extremity, the urine is allowed to flow in by capillary attraction direct from the bedroom utensil. The smallest trace of albumin would immediately cause an opalescent haze, which speedily becomes granular; while an excess instantly gives a dense opaque colloidal streak. It is under such conditions that the endolytic tube finds its greatest use, as it enables the examination for albumin to be made at the bedside, and with the smallest amount of trouble. In testing for sugar, it is necessary, after admitting the urine to the endolytic tube, to pour very hot water over the tube, or the charged tube may be left for inspection on the following day, as, when no artificial heat is supplied, it requires from twelve to twenty-four hours for the reaction to take place. The ease with which these tubes can be carried in the pocket, and the facilities they offer for immediate diagnosis, will recommend them to the use of the profession.

Messrs. R. Sumner & Co., of Liverpool, also send us a tube of tablets of Salicyl-sulphonic Acid, with a glass pipette, enclosed in a metal case, at a cost of 2/–. This is very useful for detecting the presence of albumin when visiting a patient.

Uterine Dilator.—Mr. Bryden Glendining has designed (*Fig.* 180) a form of uterine dilator so arranged that the smaller sizes telescope into the larger instruments, with the result that when nested the twenty-one dilators form three pieces with accompanying handles. The great objections to all dilators which have hitherto been made on this principle are their great weight and considerable bulk. The present set of

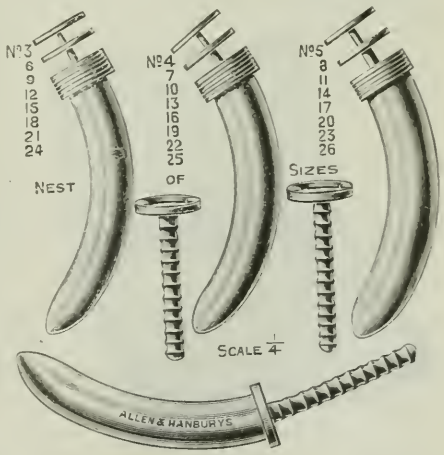

Fig. 180.

nested dilators, however, is eminently portable and comparatively light. In actual practice one handle is found sufficient, since when one size is inserted the handle is detached and rapidly fitted to the next number, and the smaller instrument withdrawn as the larger one is ready to insert. The arrangement by which the handle is fitted or detached is simple and convenient. It is made by Messrs. Allen & Hanburys Ltd., 48, Wigmore St., W.

Vaccinator (Fasquelle).—This is an ingenious arrangement by which fifty aseptic needles are retained in a case (*Fig.* 181), one coming forward at a time when a spring is pressed. This enables a fresh needle to be used for each operation. It is also arranged with a collapsible tube of vaccine, sufficient

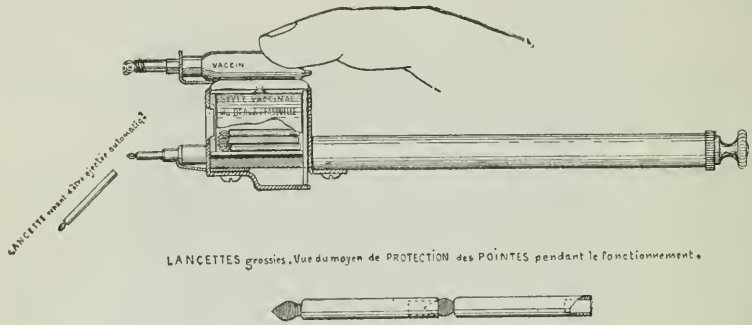

Fig. 181.

for seventy or eighty persons, which is fixed on the upper part of the magazine. A slight pressure of the tube, and a drop of the vaccine is deposited on the surface of the skin. This arrangement will be of great convenience to public vaccinators. It is supplied by The Medical Supply Association, Gray's Inn Road, W.C.

Wassermann's Reaction.—The extreme importance of this method of diagnosis in cases of syphilis renders it almost necessary that every surgeon should be able to make the test for himself. In order to facilitate this, Mr. W. Martindale, 10, New Cavendish Street, W., has put up in a neat mahogany case (*Fig.* 182) all the appliances necessary for conducting the complement-fixation test, according to Fleming's recent modification. The case occupies but little space, and contains everything that can possibly be required for making a large number of examinations. It also contains a very clear description of the most efficient way of making the test. We feel sure that this Apparatus will be very much appreciated by our readers.

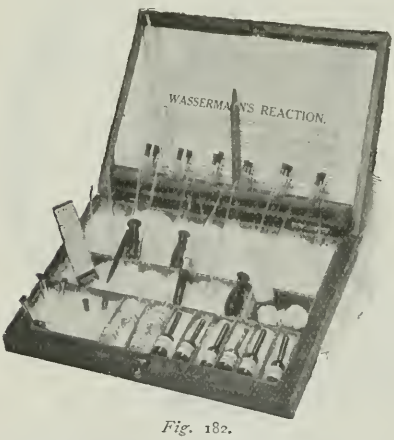

Fig. 182.

Weighing Machine.—The chief advantages of the "Jaraso" personal weighing machine are its small size and light weight. It occupies a space of only 11 by $7\frac{1}{2}$ by 8 inches, and costs 22/6. It weighs up to twenty stone. The Medical Supply Association, Gray's Inn Road, W.C.

PROGRESS OF PHARMACY, DIETETICS, &c.

Adalin is a new hypnotic and sedative which has been favourably noticed in a number of contributions by German physicians. It is issued in this country by The Bayer Co. Ltd., 19, St. Dunstan's Hill, E.C., in the form of 5-grain tablets as well as in the original powder: one or two of these constitute a sedative dose, to be taken three or four times a day in cold water (adalin is only slowly dissolved by cold water). To induce sleep, the dose is two or three tablets taken about half an hour before bedtime and followed by a hot drink. Further details as to the action and use of this drug will be found on page 2.

Agar-agar, Laxative.—This substance forms a useful aperient of the mechanical type; it does not irritate the bowel and is tasteless. It may be taken in soups and broths, cut up small; soaked in hot water and flavoured with sugar; or in the form of jelly. Messrs. R. Sumner & Co., of Liverpool, are issuing boxes, each of which contains a dozen ½-oz. packets. The contents of each of these packets constitute a full dose for an adult. We have used this substance without ill effects, even in the presence of such irritability of the bowel as is seen in mucous colitis.

"Agfa" (the initial letters of "Actien-gesellschaft Für Anilin-fabrikation") is the name given to two ointments which have been placed on the market. The one contains the now well-known "scarlet red," and is known as Scarlet R. Medicinale "Agfa"; the other embodies amido-azotoluol, the active principle of scarlet red, and is sold as Amido-Azotoluol Medicinale "Agfa." These substances are being largely used to promote epithelialization of granulating surfaces (*see* paragraph on ULCERS), primarily on the suggestion of Professor Schmieden, of Berlin; and it is claimed for the "Agfa" preparations that they alone present these substances in the actual form in which they attracted Schmieden's favourable notice. They are sold in this country by Messrs. Chas. Zimmermann & Co., St. Mary-at-Hill, E.C.

Allantoin, Solutio.—Our readers may have noted the articles by Drs. MacAlister and Bramwell extolling the common comfrey as yielding a principle which stimulates epithelial proliferation and leads to the healing of ulcers, etc. Messrs. R. Sumner & Co., of Liverpool, are sending out this active principle in the form of solutio allantoin, and we think the profession ought to give it a thorough trial.

Allenburys' Diet is so well known as a valuable invalid food that it is almost superfluous to call attention to it here; in fact, we only do so in order to point out that it may well be given in combination with the Byno-glycero-phosphates preparation of the same firm, which is noticed below. The diet is issued in hermetically-sealed tins, and is welcome not only to the patient but to the nurse, since the addition of boiling water is all that is needed to make it ready for taking.

Analgesicum, Linimentum.—This is a capital means of applying salicylate of methyl with menthol and camphor externally. It evaporates quicker than some similar liniments—an advantage in certain cases. It is made by Messrs. Evans, Gadd & Co., Bristol and Exeter.

Anti-Constipation Rectones.—Rectal medication is considered by many practitioners to be the best method of treating constipation in infants. To meet the demands of the profession, anticonstipation rectones were introduced. Each contains aloin gr. $\frac{1}{24}$, ext. belladon. gr. $\frac{1}{24}$, ext. hyoscyam. gr. $\frac{1}{24}$, ext. nucis vom. gr. $\frac{1}{12}$. They act as an efficient laxative without causing griping. Messrs. Oppenheimer, Son & Co. Ltd., 179, Queen Victoria Street, London.

Atophan (*see also p.* 7) is a German synthetic product sold in this country by Messrs. A. & M. Zimmermann, 3, Lloyd's Avenue, E.C. Its virtues as an eliminant of uric acid in the treatment of gout are highly extolled by various writers in the German medical journals. It is sold in powder form, and in soluble tablets, each of which contains ·5 gram (7½ grains). The high terms of praise used by the writers already alluded to warrant an extended trial of this drug in the treatment of the various forms of gout.

Azoules.—Under this term Messrs. Allen & Hanburys, Ltd. are issuing glass capsules each of which contains a single dose of various drugs for hypodermic, intramuscular or intravenous injection. The advantages of this method of sending out such preparations are manifest; the drug is easily carried about in an absolutely aseptic condition. We have received samples of a number of substances recently included in the list of azoule preparations: arsenate of iron (two strengths); a combination of strychnine with the glycerophosphates of iron and sodium, and another of strychnine with sodium glycerophosphate and orchitic extract; ovarian tissue, for use in cases of premature menopause and the like; a useful combination of scopolamine, morphine, and atropine; and a "neurasthenic serum" containing sodium glycerophosphate and strychnine cacodylate dissolved in physiological serum. Radio-active menthol iodine and various tuberculins (for further details *see* "Radio-active Menthol Iodine" and "Tuberculin," below) are also issued in azoules.

Beef, Liquid.—The reliability of this palatable meat extract is guaranteed by the fact that it is issued by Messrs. Allen & Hanburys Ltd. It contains the proteins of meat in a relatively high percentage; it keeps well, except when exposed to the air for a long time; and is in fact the physiological equivalent of raw meat juice without the repulsive qualities of the latter. As such, its use is indicated to supply the protein deficiencies of a milk diet in infancy and for invalids. It may also be used by itself in acute illness, at times when such preparations are needed; and it is of value in the strengthening of soups and broths. Its albumins are precipitated, however, if it is mixed with too hot water. One to two teaspoonfuls may be taken by adults as often as required, in a wineglassful of cold water. When it is being used as a staple of nourishment, one or two tablespoonfuls should be given in a teacupful of water or milk. For infants the dose is half to one teaspoonful daily. It is sold in sealed bottles.

Bismuthi c. Magnesia Conc., Mist.—Messrs. Reynolds & Branson, of Leeds, have forwarded to us a sample of this elegant antacid mixture, which will be found worthy of trial in gastric hyperacidity and allied conditions.

Bournville Cocoa, prepared by the famous Cadbury firm, is well-known to the public on account of its pure flavour. It may be well to allude here to the fact that it not merely tastes, but is, pure, and it contains as high a percentage of food value as any cocoa. It is therefore suitable, by reason of its pleasantness and also of its purity, for invalids. A cup of hot cocoa at bedtime is sometimes an effective remedy for the sleeplessness of elderly persons.

Bronchitic Elixir.—In this palatable preparation a 10-minim dose of extract of grindelia is combined with small quantities of potassium iodide and nitroglycerin; tincture of euphorbia is also included. This is intended for use in cases of bronchitis and asthma. We have had such excellent results in the treatment of some cases of this latter disorder with grindelia that we wonder it is not more widely used. The elixir is issued by Messrs. Ferris & Co., Bristol.

Brytstele Solution.—This is an aqueous solution of a pale green colour, and quite translucent, which possesses the property of preserving the lustre of all steel instruments immersed in it. It is used to, at once, preserve and render aseptic all surgical instruments. It renders sterilization by boiling unnecessary. It contains 2½ per cent of cresol, and does not evaporate, and is very cheap. Medical Supply Association, Gray's Inn Road, W.C.

Byno-Glycerophosphates.—This preparation is an elegant combination of the tonic action of the glycerophosphates with the nutritive and digestive values of a food malt extract. It should be noted that the presence of the glycerophosphates of iron, calcium, potassium, calcium, and sodium does not interfere with the diastatic action of the malt. It should be taken with food, in doses varying from one teaspoonful to one tablespoonful, three times daily. It may very conveniently be combined with the " Allenbury Diet " issued also by Messrs. Allen & Hanburys Ltd. (*see above*) : thus, three times daily a dessertspoonful (increasing to a tablespoonful) of the glycerophosphates may be added to a " dose " of the Allenbury diet. In this way the glycerophosphates are presented to the enfeebled stomach and capricious appetite of the sick man in a pleasant and assimilable form.

Byno-Hæmoglobin.—This is one of the well-known Bynin preparations of Messrs. Allen & Hanburys Ltd. For those who wish to administer iron in the form of hæmoglobin, this is a very suitable preparation, on account of its elegance, and also because the therapeutic and food values of malt are added to that of the hæmoglobin. The manufacturers suggest that it is particularly adapted for weakly children and in convalescence.

Capsici Co., Linimentum.—This is a convenient rubefacient liniment, and contains methyl salicylate also. Messrs. Reynolds & Branson, Leeds.

Caryophilli.—It is now recognized by the medical profession that for internal use the powdered clove gives much better results than the isolated oil : this is stated to be due chiefly to the presence of fibre, which delays absorption. This exceedingly useful drug is best given in palatinoid form : its keratin coating resists solution by the gastric juice, thus permitting the drug to pass through the stomach unchanged, being dissolved in the alkaline fluid in the intestine, where it exerts its maximum therapeutic effect. In " Palatinoid " caryophylli the freshly powdered clove is employed ; the air-tight covering of the coating preserves its volatile constituents indefinitely. Messrs. Oppenheimer, Son & Co., Ltd., 179, Queen Victoria Street, London.

Chocolates.—We have received samples of milk chocolate, chocolate creams, and chocolate biscuits from Messrs. Cadbury Bros., of Bournville, Birmingham. The admirable conditions under which the manufactures of this firm are prepared, by work-people whose health is a prime consideration with their employers, are well known to the world ; and it is not to be wondered that the products emanating from such a source are second to none of their kind for excellence both of purity and of flavour. It is not always recognized that milk chocolate is a concentrated carbon food, and may be used as such for invalids, especially children, in acute illness. In the same way we have found it valuable on long walks ; it is convenient to carry, easily eaten, and " stays by " one in a remarkable way.

Cinnamon Compound Tablets.—Each of these tablets, issued in bottles by Messrs. Ferris & Co. Ltd., Bristol, contains ½ minim of formaldehyde ; they are flavoured with oil of cinnamon, and those to whom we have given them have preferred them as pleasanter to take than other tablets designed to liberate formaldehyde in the mouth. They are destined for use in cases of sore throat, mild oral sepsis, etc.

Corpora Lutea, Capsules (Parke, Davis & Co.).—These capsules, each of which contains 5 grains of desiccated corpus luteum (equivalent to 30 grains of the fresh substance), are issued in bottles of 25 and 100. This preparation deserves a careful trial in all menopausal conditions, especially in the artificial climacteric following oöphorectomy and in the treatment of those metabolic disturbances which add to the distress of a premature menopause.

Cusylol is a soluble copper citrate recommended for use as a lotion in the treatment of conjunctivitis and other mucous membrane inflammations. It is sold by Messrs. Chas. Zimmermann & Co., St. Mary-at-Hill, E.C.

Diatogen is issued by Messrs. Ferris & Co., Bristol, as a tonic nerve food, absolutely free from sugar and readily assimilated. It is designed for administration to diabetics, and may be given with warm water, tea, or cocoa. The dose is one or two large teaspoonfuls three times daily (half the quantity for children). It is supplied in tins of three sizes. The flavour is pleasant and biscuity.

Diphtheria Antitoxin, Concentrated (Messrs. Burroughs Wellcome & Co.). —This is a move in the right direction. One of the great objections to the administration of antitoxin, especially to young children, is the pain caused by subcutaneous injection of a large bulk of fluid. Messrs. Burroughs Wellcome & Co. have endeavoured to remedy this by embodying full doses of the antitoxin (1000 to 5000 Ehrlich-Behring units) in a relatively small bulk of solvent (1 c.c. or less of fluid). Each dose is sent out in the usual hermetically-sealed phial.

Drop Flavours.—These are concentrated solutions suitable for flavouring and tinting all medicine in liquid form, whether for internal or external use. They are so concentrated that one drop is sufficient for one ounce of liquid. All the "drop flavours" are free from sugar, and the colouring matter is perfectly harmless. They are issued in 1-oz. stoppered drop bottles, which are a great convenience to the practitioner. In the case of mixtures for internal use they impart an elegant appearance not ordinarily obtainable, and greatly improve the flavour. Messrs. Oppenheimer, Son & Co. Ltd., 179, Queen Victoria Street, London.

Epinine.—This substance, issued by Messrs. Burroughs Wellcome & Co., marks an important forward step in pharmacology. It is a synthetically-prepared product with a twelve-syllable name, for which it is claimed that it possesses all the physiological properties of the active principle of the suprarenal gland with some additional advantages. Chemically epinine differs from the organic substance only in the introduction of an OH group into the former; purity is also more readily achieved. The diagram (*Fig.* 183) illustrates the difference between the effect of the two substances on the arterial pressure. We have received epinine from the manufacturers in the following forms: epinine pure, in 10-c.c. amber-coloured bottles and in 1-c.c. hermetically-sealed phials called "vaporoles," also embodied in an ophthalmic tabloid; and epinine with cocaine hydrochloride, also in 10-c.c. bottles and 1-c.c. vaporoles. We do not pretend to pass judgment on the relative efficiency of this new product and the active suprarenal principle, as such a matter can only be decided by accumulation of clinical as well as experimental evidence; but in any case the manufacturers are to be congratulated on so enterprising an application of scientific methods, and their preparation deserves exhaustive trial.

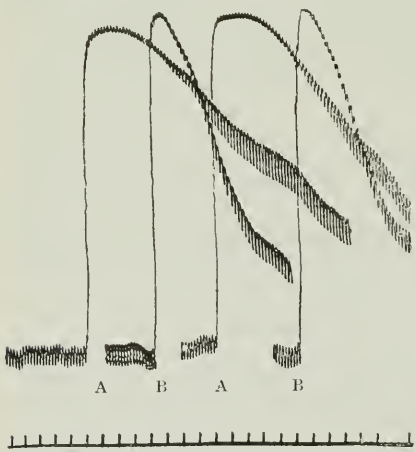

Fig. 183.—Tracings showing Rise of Blood-pressure caused by "Epinine" and "Hemisine."

A=0·5 mgm. 2:4 dihydroxyphenylethylmethylamine ("Epinine").

B=0·05 mgm. suprarenal active principle ("Hemisine").

Note equal height of A & B, but greater persistence of A.

Erythemol is a preparation which has been favourably noticed in previous issues of the *Annual*, and we are glad to find that the manufacturers, Messrs. Sumner & Co., of Liverpool, have issued it in the form of suppositories for use in cases of hæmorrhoids.

Ferro-Sajodin, sold by The Bayer Co. Ltd., is a combination of iron with an organic iodine compound, the use of which is indicated in such conditions as those for which the B.P. syrupus ferri iodidi is prescribed. It is issued in tablets of $7\frac{1}{2}$ gr. each. The advantage claimed for it is that it is not irritating to the stomach. Continental physicians report favourably as to its action.

Formitrol Pastilles.—Each contains gr. $\frac{1}{6}$ absolute formaldehyde, with menthol and citric acid in a lactose base. Each pastille is wrapped in silver paper to prevent the loss of formaldehyde by evaporation. We have used these pastilles, and find them a very effective method of oral antisepsis. One thing that should recommend them to the medical profession is that, unlike certain analogous preparations, they are not advertised in the lay press. The manufacturers are Messrs. A. Wander Ltd., Leonard Street, City Road, E.C.

Formosyl Gargle.—This has been put up by Mr. W. Martindale, 10, New Cavendish Street, W., as a convenient mouth wash or nasal douche. It is a happy combination of phenol, boric acid, formaldehyde, and essential oils in a concentrated saline solution. It is employed diluted in various proportions, and will meet a common want in prescribing mouth washes and douches for the nose.

Glycerophosphates. (*See also* BYNO-GLYCEROPHOSPHATES and LECITHIN.)—From Messrs. C. J. Hewlett & Son Ltd, 35–42, Charlotte Street, E.C., we have received tablets containing glycerophosphates of iron, calcium, sodium, potassium, and manganese, with citrate of caffeine and arsenic. They are chocolate-coated, and we find them palatable; one is given thrice daily between meals.

Grey Powder Tablets.—We are very favourably impressed with these tablets. Each contains hydrarg. c. creta gr. $\frac{1}{3}$, and is made up with chocolate. A better means of administering grey powder to a suspicious and refractory child could scarcely be imagined. Messrs. Ferris & Co. Ltd., Bristol.

Hæmoglobin Co. Tabellæ.—These tablets are pleasant to look at and to take. Each contains hæmoglobin 2 gr., ferrum redactum 1 gr., ext. nucis vomicæ gr. $\frac{1}{8}$, aloin gr. $\frac{1}{16}$, arsenious acid gr. $\frac{1}{200}$. It will be seen that this tablet is indicated for use in chlorosis and other forms of anæmia, though opinions will vary as to the relative importance of the part played by the hæmoglobin as compared with the inorganic iron. The preparation comes from Messrs. R. Sumner & Co., of Liverpool.

Halakones are a clever device, to be credited to Mr. Frank A. Rogers, 327, Oxford Street, W., which are to be included among the various things which go to show that Britons are determined no longer to be slaves to their traditional complaint, the common cold. They are cones of stiffened gauze, impregnated with menthol, eucalyptol, etc., for introduction into the anterior nares. We have tried them, and find that they are invisible to the passer-by, quite comfortable, and capable of drying up a mild coryza quite quickly. They also act as filters to the inspired air, and as such may prove useful to sufferers from hay asthma.

Hyposol Ampoule-Syringe (The).—A clever device issued by Messrs. Allen & Hanburys to give practitioners a means of hypodermic medication without the loss of time involved in sterilizing the syringe and the skin. The apparatus as issued consists of (*a*) The hermetically-sealed hyposol itself, which contains the solution to be administered; it is a glass cylinder drawn out at either end, the one being ground to fit the needle, the other to carry

the stem to be fitted to the cellulose plunger which lies ready for use within the glass barrel; (*b*) The needles; (*c*) The stem of the plunger. A large number of solutions are supplied, ranging from 8s. to 12s. per dozen hyposols; and also a number of vaccines. It is claimed that the extra cost is balanced by the time saved, and by the fact that the usual glass syringes are very liable to break, and therefore to involve the practitioner in a good deal of expenditure.

Inhalone.—We have personally tested this admirable preparation supplied by Messrs. Parke Davis & Co., and can witness to its value. It is a ready means of introducing volatile antiseptics into the nasal passages without awkward apparatus, and is therefore especially useful for the nasal disorders of childhood. It is a combination of phenol, eucalyptol, and menthol, with soft paraffin as a base; and its introduction into the nostril is readily accomplished by insertion of the elongated tip which forms the opening of the collapsible tube in which it is sold.

Iodex is an iodine ointment issued in 1-oz. pots, either by itself, or in combination with methyl salicylate. Its particular virtue is that it furnishes a method of local application of iodine by which percutaneous absorption of the drug can be accomplished without any staining of the skin. The indications for its use are therefore very numerous. The vendors are Messrs. Menley & James Ltd., Farringdon Road, E.C.

Iodi-Intinctum Ung. is a preparation similar in nature and intention to the above. It is issued by Messrs. Evans, Gadd & Co. Ltd., of Bristol and Exeter. The moderate price at which this ointment is offered should be specially noted.

Iodine has come into its own again as an antiseptic for sterilizing the skin before operations, etc. It is far more effective when freshly prepared; and in order to make this possible without inflicting the danger of a bad mess in the instrument bag of the surgeon who uses it, Messrs. R. Sumner & Co., of

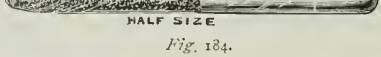

Fig. 184.

Liverpool, have prepared tubes (*Fig.* 184) containing the necessary solid ingredients, at the suggestion of Major F. J. W. Porter, R.A.M.C., D.S.O. Tubes are supplied in two sizes, costing 6d. and 1s., to make ½ oz. and 1 oz. of tincture of iodine on addition of the requisite quantity of spirit. The iodine within the tube is liberated by breaking the latter at a file-mark. A patent has been applied for.

Iron-Somatose combines the medicinal properties of iron with the well-known food-stuff somatose. It is therefore well adapted for trial in cases of convalescence from gastric ulcer and other conditions in which the treatment of anæmia is interfered with by a weak stomach. One or two teaspoonfuls are given with water, milk, or cocoa three or four times daily, with or after food. It is sold by The Bayer Co. Ltd., St. Dunstan's Hill, E.C.

Lactophosphene is a tonic food prepared by Messrs. R. Sumner & Co., of Liverpool. It is sold in 3-oz. tins at 1s., in 9-oz. tins at 2s. 6d., and in bulk at 4s. per lb. The indications for the use of such a preparation are well known.

Laxarine.—A concentrated cordial containing the active principles of Rhamnus purshianus. Prepared from the dried bark which has been specially selected, it forms a pleasant and effective means of exhibiting the laxative and intestinal tonic properties of cascara. It is entirely free from the objectionable qualities contained in the many products of this useful drug, and is especially adapted for invalids on account of its gentle action. Messrs. Oppenheimer, Son & Co. Ltd., 179, Queen Victoria Street, London.

Lecithin (*see also* GLYCEROPHOSPHATES) is sold in chocolate-coated tablets, by itself or in combination with glycerophosphates, by Messrs. C. J. Hewlett & Son Ltd., 35–42, Charlotte Street, E.C. This is a convenient means of using an organic phosphorus substance which is of value as a restorative in metabolic disorders and diseases of the central nervous system.

Lithio-Colchicine Pil.—Each pill contains colchicine salicylate gr. $\frac{1}{66}$, lithium salicylate gr. $1\frac{1}{4}$, lithium guaiacate gr. $\frac{1}{2}$, asepturin gr. $\frac{1}{2}$, ext. saw palmetto gr. $\frac{1}{4}$. It is recommended that one or two be given every four hours for acute gout, etc. It is an elegant preparation, by Messrs. R. Sumner & Co., of Liverpool.

Lysol has taken its place among the most useful and therefore most used antiseptics. We may, however, call the attention of the profession to the very convenient and safe emergency bottle in which it can be bought from Messrs. Chas. Zimmermann & Co., St. Mary-at-Hill, E.C.

Malonal, Elixir.—Malonal is stated by the text-books to be synonymous with veronal. The elixir prepared by Messrs. R. Sumner & Co., of Liverpool, gives the doctor a very pleasant method of administering this rather insoluble hypnotic to his patient.

Malted Rusks (Allen & Hanburys Ltd.).—These rusks are very palatable, and may well be used in the diet of the normal child at the stage of transition from a wholly fluid to a partially solid diet, for they do not inflict any excessive burden on the immature starch-digesting powers of the infant. For similar reasons they are likely to be useful in the feeding of invalid children whose diastatic powers are impaired.

Medulla, Glycerin.—This is a glycerin extract of the bone-marrow of the ox; and as a method of giving this substance in an agreeable form, Messrs. Reynolds & Branson's preparation is hard to beat. It is pleasant in taste, as well as in colour and smell.

Menthacones.—Messrs. Parke, Davis & Co. have issued a menthol pencil in a neat little aluminium pocket case with a cap at each end. If one of these be taken off, the menthol is available for external application; if the other be removed, it can be used for nasal inhalation.

Menthol-iodine, Radio-active.—A fuller account of the claims put forward for this interesting compound will be found elsewhere in this volume (*p.* 553). It is sold in azoules for injection by Messrs. Allen & Hanburys, Ltd. Three formulæ are in use; in the first iodine is present as such, in the second as iodoform, in the third as iodized peptone. Each of them is sold in the azoules.

Midget Smelling Salts are sent out packed in waistcoat-pocket boxes by Messrs. Ferris & Co., Bristol, in the form of capsules enclosed in silk coverings similar in form and method of use to those which are employed for amyl nitrite. This is a useful addition to the emergency bag, and may also be handed to patients who are likely to need a rapid and harmless stimulant.

Mucotan Pessaries.—These vaginal pessaries were made by Messrs. R. Sumner & Co., to meet the wishes of a customer, for the treatment of leucorrhœa. "Mucotan" consists of liquid extract of red gum, liquid extract of hamamelis, and suprarenalin. The action is antiseptic and astringent. The results are said to be very satisfactory.

Nargol Bougies (Messrs. Parke, Davis & Co.) contain nargol, a nucleinate of silver, mixed with a base which melts slowly at the intra-urethral temperature, in a strength of either 1 per cent or 2 per cent. The bougies are supplied in boxes of 25, which also contain a rubber introducer. They are intended for the treatment of gonococcal urethritis. We have had good results with bougies of this type, and do not doubt that the preparation under notice will be found an efficient means of introducing organically combined silver into the urethra.

Oculets.—We have received from Messrs. Parke, Davis & Co. a tube of these lamellæ, containing homatropine and cocaine in a quickly soluble base for use in ophthalmic work. The same firm send out other drugs in a like form for similar purposes.

Omnopon has received more notice in Germany than in this country, though recent articles in our own journals are very commendatory. It is referred to under the name " Pantopon " (used in Germany) in the *Medical Annual* for 1911, *p.* 42, and in the present volume, *p.* 30. The principal claims for it are that it contains all the alkaloids of quinine in the form of soluble hydrochlorides ; that, weight for weight, it is five times as strong as opium ; and that the indications for its use are those of opium. It has also proved valuable as an adjunct to general anæsthesia. The neat little box sent to us contains tubes of powder, each containing $\frac{1}{6}$ gr. ; tablets also of $\frac{1}{6}$ gr. each ; and ampoules containing each 1·1 c.c. of a 2 per cent solution of omnopon for injections. It is sold in England by the Hoffman-La Roche Chemical Works Ltd., Idol Lane, E.C.

Pertussic Elixir (Ferris & Co., Bristol).—This is a preparation containing a saccharated extract of German thyme, a drug which has been employed with benefit in the treatment of whooping-cough.

Phenazon. Co. Tabl.—Messrs. R. Sumner & Co. have devised these as a means of prescribing the following mixture, which they say is widely used in the treatment of dysmenorrhœa : phenazone gr. 5, ammonium carbonate gr. $1\frac{1}{2}$, sodium bicarbonate gr. $2\frac{1}{2}$.

Pituitary Gland Extract.—Ten-minim doses of this very useful substance are sold ready for injection in " Sterisols " by Messrs. Ferris & Co., of Bristol.

Pituitrin is the form in which Messrs. Parke, Davis & Co. present to us the active principles of the infundibular portion of the pituitary gland. The vasotonic properties of this substance have brought it into use in the treatment of post-operative shock and collapse and similar conditions ; and recent hospital experience has brought us to believe that pituitary extract is the best remedy available in such emergencies. It also possesses a powerful uterine tonic effect. Pituitrin is a reliable preparation of this useful medicament ; it is issued in ampoules, each of which contains 1 c.c., in boxes containing six or twelve each.

Pulversols.—These consist of various salts in powder form, issued in a tin-foil shape like a tablet and used for making solutions. When required for use, all that is necessary is to press the pulversol between the finger and thumb and the powder is released ; it may be immediately dissolved in water, thus eliminating the risk of breaking glass measures, which is a frequent occurrence when tablets are prescribed. Practitioners can have their private formulæ put up in this form. The various formulæ prescribed for nasal and oral use will be found in this form vastly superior to the old-fashioned tablets and prove a great convenience alike to the practitioner and the patient. Prepared by Messrs Oppenheimer, Son & Co. Ltd., 179, Queen Victoria Street, London.

Retlanol, Ung.—We venture to call attention once more to this useful antipruritic, and particularly to the moderate price at which it is sold by Messrs. Evans, Gadd & Co, Bristol & Exeter.

Rheumatic Fever (Streptococcus) Vaccine.—Messrs. Burroughs Wellcome and Co. are offering a vaccine prepared from several strains of the *Micrococcus rheumaticus*, the probable causal agent of rheumatic fever, for the treatment of that disease. It is issued in hermetically-sealed phials each containing 1 c.c., in which there are 10 or 50 million organisms. This plan of treatment has its advocates, and it certainly has much to recommend its trial from the theoretical point of view.

Salicyl. c. Chloroform., Unguentum.—This ointment contains oil of wintergreen (methyl salicylate), menthol, and chloroform. It is therefore rubefacient, and also affords a means of giving a salicylate percutaneously. It is sold by Messrs. Ferris & Co., Bristol.

Scarlet Red Ointments.—We have alluded above to the "Agfa" preparations; other ointments bringing the epithelializing action of scarlet red into practical use have been prepared by Messrs. Reynolds & Branson, of Leeds, and by Messrs. C. J. Hewlett & Co., Charlotte Street, E.C. The latter firm also issue a compound scarlet red ointment, which contains boric acid and compound tincture of benzoin as well as scarlet red 8 per cent.

Sea Water Injections.—We have received a very large number of letters upon this subject. We think the following particulars will answer many of the questions asked.

Sea water, pure or ready mixed for use, can be obtained from Messrs. R. Sumner & Co., of Liverpool, or Messrs. Oppenheimer, Son & Co., of London. We prefer to inject it with an ordinary serum syringe with a long needle, refilling the syringe (without removing the needle) as often as is necessary. The side of the buttock just above the trochanter is the best site for injection. The same site of injection appears better than changing it to the opposite side, as the tissues appear to adapt themselves to the injection and it flows in more easily. Newly-boiled tap water appears to give better results than distilled water to dilute the sea water. The proportion of 3 of sea water to 5 of tap water is the ordinary proportion.

The only reports we have received of either local or general reactions, as a result of injection, have been when either distilled water or prepared ampoules have been employed.

In many hundreds of injections we have not experienced a single unfavourable symptom. Some of our best results have been obtained in cases of pruritus with or without eczema. Chronic psoriasis yields better results than cases of the acute form. We have no experience in the adynamic diseases of infants, but have received many favourable reports of such cases.

The needles between the injections are kept in a solution of Brytstele containing 2½ per cent of cresol.

Sophol is a formo-nucleinate of silver. It is recommended for use, in 2 to 5 per cent solutions in water, as an eye lotion in cases of conjunctivitis or for the prevention of ophthalmia neonatorum. In connection with its use in the latter instance, it should be noted that it is non-irritating. It is sold by The Bayer Co. Ltd., St. Dunstan's Hill, E.C.

Spirosal Co., Unguentum.—This ointment contains 40 per cent spirosal, an odourless, non-irritating salicylic compound, in lanolin with menthol. It is sold in 1-oz. and 2-oz. collapsible tubes. Its use is as a means of applying salicylic acid locally, for absorption through the skin; as such we have found it most satisfactory. The part to be treated should be warmed before the ointment is applied. It is sold by Mr. Frank A. Rogers, 327, Oxford Street, W.

Stearosan is a compound of santalyl, the active principle of sandal-wood oil, with stearic acid. It is odourless and tasteless, and does not upset the stomach; it is therefore to be recommended as an innocent means of giving sandal-wood oil to patients with gonorrhœa. Messrs. Parke, Davis & Co. supply it in the convenient form of globules, each of which contains 10 min. (equivalent to about 5 min. of sandal-wood oil).

Tab. Lozenges.—These lozenges, prepared by Mr. Frank A. Rogers, 327, Oxford Street, W., which we noticed in the 1910 volume of the *Medical Annual*, are now sold in boxes each containing five tubes of lozenges.

Thymo-Antiseptic.—This alkaline antiseptic solution, prepared by Messrs. Evans, Gadd & Co., Bristol & Exeter, is one of a well-known class. It is worthy of special notice because of the reasonable price at which it is sold (2s. 6d. per lb.).

Tonagen Chocolate (Messrs. Ferris & Co., Bristol).—Last year we noticed favourably the corresponding cocoa preparation. The chocolate is sold in boxes of cubes, which may be eaten or dissolved to form a beverage; each contains half a teaspoonful of tonagen, a tonic food. This will be found an excellent preparation for convalescent children.

Tuberculins.—The number of tuberculins on the market is bewildering, and this is not the place to comment on their respective merits and drawbacks. For its use as a diagnostic agent by the blister method, we have received two capital preparations: a "Tuberculin Ointment" prepared by Messrs. Ferris & Co., Bristol, and a small box of 10 tubes of tuberculin for the De C. Woodcock reaction, sold by Messrs. Parke, Davis & Co. A very complete series of tuberculin preparations for therapeutic purposes is sent out by Messrs. Allen & Hanburys Ltd. in "azoule" form (for details see special list sent on application). Messrs. A. & M. Zimmermann, Lloyd's Avenue, E.C., call attention to Rosenbach's tuberculin, which has been noticed favourably in an English journal.

Ung. Zoleas.—A most effective application for all forms of dry eczema, especially those of gouty origin or where excessive sugar is taken. A noted consultant at whose suggestion this ointment was introduced states, "This ointment will cure dry eczema of the hands or anywhere else. I know this from personal experience; it used to torment me." It is composed of zinc, mercury, and oleic acid, and is issued in collapsible tubes, which are a great convenience in use. Messrs. Oppenheimer, Son & Co. Ltd., 179, Queen Victoria Street, London.

Vaccines of various kinds are stocked by most of the leading pharmaceutical firms. Those who believe in stock vaccines, and wish to obtain them from the fountain-head, are referred to Messrs. Parke, Davis & Co., who sell vaccines prepared in Sir Almroth Wright's laboratory at St. Mary's Hospital. We have received samples of a pneumococcus vaccine, and of a parodontal streptococcus vaccine, from this firm; the latter preparation is recommended for the treatment of pyorrhœa alveolaris and similar morbid conditions of the teeth and gums. The former is said to be of value, not only in lobar pneumonia, but also in cases of bronchitis in which the pneumococcus is the predominant micro-organism.

Violæ Dulcis, Liq.—This is an admirable colouring and flavouring solution for addition to mixtures. It is prepared by Messrs. R. Sumner & Co., who advise the addition of 1 dr. to 8 oz. of a colourless mixture. It is compatible with alkalies and acids, but its colour is apt to be discharged by spirits of nitrous ether.

Vitaregis Water.—This is an aperient table water, closely akin to the sulphur waters of Harrogate and other British spas. It is given in doses of a wineglassful before breakfast. From details kindly given to us by the Vitaregis Water Co., 39, Aldermanbury, E.C., we learn that it contains the tartrate and the sulphate of sodium, magnesium sulphate, and a small quantity of sodium chloride. It is also said to be radio-active. We find it pleasant to take, and effective as a gentle aperient. The profession may safely recommend this preparation as a table water in such conditions as are usually benefited by systematic saline purgation.

Wassermann Test.—Messrs. Burroughs Wellcome & Co. have issued sealed phials, each containing 1 c.c. of alcoholic extract of guinea-pig's heart and of hæmolytic serum from sheep's corpuscles respectively, for use in the performance of this test.

Xaxa and Caffeine Tabloids are issued by Messrs. Burroughs Wellcome & Co. Each contains .4 gr. of acetyl-salicylic acid and 1 gr. of caffeine, the latter being included to counteract the cardiac depressant effect which is ascribed to the former on somewhat scanty evidence.

BOOKS OF THE YEAR.

A List of the Principal Medical Works and New Editions Published during 1911.

*** For the convenience of our readers any of the works in this list can be obtained from Messrs. John Wright & Sons Ltd., "Medical Annual" Offices, Bristol.*

AMBULANCE AND NURSING.

Atlas of First-Aid Treatment. By Bernard Myers. 12mo, 12 plates, pp. 56. *Baillière* - - - - - *Net* 1s. 6d.

British Red Cross Society Training Manual. No. 3. By James Cantlie. 12mo, pp. 246, limp. *Cassell* - - - - *Net* 1s.

District Nursing. By Mabel Jacques. Cr. 8vo. *Macmillan. Net* 4s. 6d.

First Aid to the Injured and Sick. An Advanced Ambulance Handbook. By F. J. Warwick and A. C. Tunstall. 7th ed., revised. 12mo, pp. 260. *J. Wright & Sons Ltd.* - *Net* 1s. *Leather, Net* 2s. 6d.

Nursing at Home. With Chapters on the Care of Infants and Children. By J. D. E. Mortimer. 16mo, boards. *G. Gill* - *Net* 8d.

Practical Nursing. By Isla Stewart and Herbert E. Cuff. 3rd ed. revised. Cr. 8vo, pp. 444. *W. Blackwood* - - - *Net* 5s.

Red Manual of First Aid and Stretcher Drill. By D. M. Macdonald. Cr. 8vo, pp. 78. *G. Gill* - - - - *Net* 1s.

Sick Nursing Examination Questions. A Catechism on Home Nursing and Hygiene. By D. M. Macdonald. 2nd ed. 12mo, sewed, pp. 33. *J. Wright & Sons Ltd.* - - - - - *Net* 6d.

ANATOMY AND PHYSIOLOGY.

Aids to Histology. By Alexander Goodall. (Students' Aids Series.) 12mo, pp. 144. *Baillière* - - - - *Net* 2s. 6d.

Anatomical and Surgical Study of the Fractures of the Lower End of the Humerus: Fractures of the Elbow. By A. P. C. Ashhurst. Demy 8vo. 150 Illus. *H. Kimpton* - - - *Net* 14s.

Anatomy of the Brain and Spinal Cord. By J. Ryland Whitaker. 4th ed. 103 Illus. Cr. 8vo, pp. 244. *Livingstone* - - *Net* 5s. 6d.

Anatomy and Topography of the Accessory Air Sinuses of the Nose in Childhood. By A. Onodi. Imp. 8vo. 102 Plates and descriptive letterpress. *J. Bale* - - - - *Net* 21s.

Bone-Setting, and the Treatment of Painful Joints. By Frank Romer and L. Eliot Creasy. Cr. 8vo, pp. 62. *Nisbet* - *Boards, Net* 1s.

Disease in Bone, and its Detection by the X-rays. By Edward H Shenton. Illus. Roy. 8vo, pp. 82. *Macmillan* - - *Net* 4s. 6d.

Disorders of Post-Natal Growth and Development. By H. Gilford. Illus. Roy. 8vo. *Adlard* - - - - *Net* 15s.

Essentials of Surface Anatomy. By C. R. Whittaker. 2nd ed. 8vo. *Churchill* - - - - - - - *Net* 3s. 6d.

Further Experiments upon the Blood Volume of Mammals, and its Relation to the Surface Area of the Body. By G. Dreyer and W. Ray. 4to, pp. 22. *Dulau* - - - - *Sewed, Net* 1s.

Growth of the Bone. By Sir Wm. Macewen, M.D. Illus. Demy 8vo, pp. 216. *J. MacLehose* - - - - - *Net* 10s.

HANDBOOK OF PHYSIOLOGY. By W. D. Halliburton. 10th ed. Demy 8vo, 700 Illus., pp. 946. *J. Murray* - - - - *Net* 15*s.*

HUMAN PHYSIOLOGY. Vol. I—CIRCULATION AND RESPIRATION. By Luigi Luciani. Roy. 8vo, pp. 606. *Macmillan* - - *Net* 18*s.*

INTERNAL SECRETIONS AND THE PRINCIPLES OF MEDICINE. By Charles E. de M. Sajous. 4th ed., revised. 2 Vols. Illus. Roy. 8vo, pp. 1873. (*F. A. Davis Co.*), *Stanley Phillips* - - - *Net* 50*s.*

LABORATORY TEXT BOOK OF EMBRYOLOGY. By C. S. Minot. 2nd ed. 4to. 262 Illus. *Churchill* - - - - *Net* 16*s.*

MANUALS OF PHYSIOLOGY. For Students and Practitioners. By H. Willoughby. *Oxford Medical Publications.* Cr. 8vo, pp. 764. *H. Frowde, Net* 15*s.*

NEW PHYSIOLOGY IN SURGICAL AND GENERAL PRACTICE. By A. Rendle Short Cr. 8vo, pp. 210. *J. Wright & Sons Ltd.* - - *Net* 4*s.* 6*d.*

PHYSIOLOGY. By W. D. Halliburton. 12mo, pp. 188. *Dent.* *Net* 1*s.*

QUAIN'S ELEMENTS OF ANATOMY. Vol. I—EMBRYOLOGY. By T. H. Bryce. 11th ed. Roy. 8vo. *Longmans* - - - *Reduced to Net* 9*s.*

QUAIN'S ELEMENTS OF ANATOMY. Vol. III. Parts 1 and 2. Roy. 8vo. *Longmans* - - - *Reduced to, each Net* 10*s.* 6*d.*

RACIAL ANATOMY OF THE PHILIPPINE ISLANDERS. By R. B. Bean. Cr. 8vo. *Lippincott* - - - - *Net* 9*s.*

SURGICAL APPLIED ANATOMY. By Sir Frederick Treves. 6th ed., revised by Arthur Keith. 137 Illus., including 58 in colour. Fcap 8vo, pp. 676. *Cassell* - - - - - - - 9*s.*

TEXT-BOOK OF PHYSIOLOGY. By William H. Horrell. 8vo, pp. 1018. Illus. 4th ed. *Saunders* - - - - *Net* 18*s.*

TEXT-BOOK OF SURGICAL ANATOMY. By William Francis Campbell. 8vo, pp. 675. 319 Illus. 2nd ed. *Saunders* - - - *Net* 21*s.*

TUBERCULOUS DISEASES OF BONES AND JOINTS: THEIR PATHOLOGY, SYMPTOMS AND TREATMENT. By Sir W. Watson Cheyne. 2nd ed. *Oxford Medical Publications.* Demy 8vo, pp. 416. *H. Frowde* - *Net* 16*s.*

BACTERIOLOGY.

AIDS TO BACTERIOLOGY. By C. G. Moor and William Partridge. 2nd ed. *Student's Aids Series* 12mo. *Baillière* - - - *Net* 3*s.* 6*d.*

INTRODUCTION TO BACTERIOLOGICAL AND ENZYME CHEMISTRY. By Gilbert J. Fowler. Cr. 8vo, pp. 336. *E. Arnold* - - *Net* 7*s.* 6*d.*

LABORATORY GUIDE IN BACTERIOLOGY. By Paul G. Heinemann. 2nd ed., enlarged and revised. 12mo, pp. 216 *Camb. Univ. Press.* *Net* 6*s.*

MANUAL OF BACTERIOLOGY, CLINICAL AND APPLIED. By R. Tanner Hewlett. 4th ed. Demy 8vo, pp. 716. 26 Plates and 72 Illus. *Churchill. Net* 10*s.* 6*d.*

MICRO-ORGANISMS AND FERMENTATION. By Alfred Jorgensen. 4th ed., completely revised. Demy 8vo, pp. 502. *C. Griffin* - *Net* 15*s.*

PRACTICAL BACTERIOLOGY, BLOOD WORK AND ANIMAL PARASITOLOGY. By E. R. Stitt. 2nd ed. 91 Illus. Cr. 8vo. *H. K. Lewis* - *Net* 6*s.* 6*d.*

STUDIES IN LABORATORY WORK. By C. W. Daniels and H. B. Newham. 3rd ed. Demy 8vo, pp. 552. Illus. *J. Bale* - - *Net* 12*s.* 6*d.*

TEXT-BOOK ON DISEASE-PRODUCING MICRO-ORGANISMS. By M. Herzog. 8vo, 644 pp. 14 Col. Plates and 1214 Illus. *Baillière* - *Net* 21*s.*

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Royal Asylum, Gartnavel. Res. Phys. Supt., Landel R. Oswald, M.B.

Private Patients only; a special feature being the admission of recent acute cases at low rates of board.

Smithston Asylum, Greenock. Med. Off., Jas. Laurie, M.B. Res. Med. Off., Dr. Janie S. McLauchlan. Access—Greenock West, 1½ miles.

Gloucester.—*Barnwood House.* Res. Med. Supt., J. G. Soutar, M.B., C.M. Access—Gloucester, 2 miles. *See also p.* 846

Gloucester County Asylums, Wotton and Barnwood, Gloucester. Res. Med. Supt., Dr. R. B. Smyth. Access—Gloucester station, 1 mile.

Great Yarmouth.—*Royal Naval Hospital.* Fleet Surgeon in charge. Access—Great Yarmouth station, 1 mile. For Naval patients only, admitted by Admiralty order.

Guernsey.—*St. Peter Port Asylum.* Med. Off., E. K. Corbin, M.R.C.S.

Haddington, N.B.—*District Asylum,* 17 miles from Edinburgh. Med. Supt., J. Bruce-Ronaldson, M.D. Access — Haddington station, 10 minutes.

Hatton (near Warwick). — *County Asylum.* Res. Med. Supt., A. Miller, M.B. Access—Hatton station, 2 miles; Warwick, 3 miles.

Hayward's Heath.—*Brighton County Borough Asylum.* Res. Med. Supt., C. Planck, M.A., M.R.C.S. Access—Hayward's Heath, 1½ miles.

Hellingly.—*East Sussex County Asylum.* Res. Med. Supt., F. R. P. Taylor, M.D. *See also p.* 842

Henley-in-Arden (Warwickshire).—*Glendossil* and *Hurst Houses* (for both sexes). Res. Prop., Dr. S. H. Agar. Access—Henley-in-Arden, G.W.R., ¾ mile.

Hereford.—*County and City Asylum.* Res. Med. Supt., C. S. Morrison, L.R.C.P. Ed. Access—Barrs Court, G.W., Mid., and L. & N.W.R. Hereford, 3 miles.

Hitchin (Herts), near.—*Three Counties Asylum.* Res. Med. Supt., L. O. Fuller, M.R.C.S., L.R.C.P. Access—Three Counties stat., 1 mile.

Hull.—*City Asylum.* Res. Med. Supt., J. Merson, M.D. Access—Willerby station, 1 mile.

Inverness.—*District Asylum.* Med. Supt., T. C. Mackenzie, M.D. Access—Inverness, 2½ miles.

Ipswich.—*Borough Mental Hospital.* Med. Supt., Dr. E. L. Rowe. Access—Ipswich, 2 miles.

Isle of Man.—*Lunatic Asylum,* Union Mills. Res. Med. Supt., W. Richardson, M.D. Access — Douglas, 3 miles.

Isle of Wight.—*The County Asylum,* Carisbrooke. Res. Med. Supt., Harold Shaw, M.B. Access—Blackwater, ¾ mile; Newport, 2½ miles.
See also p. 843

Isleworth (Middlesex).—*Wyke House.* Res. Prop., Dr. F. Murchison. Access—Isleworth, Brentford, and Osterley station, 1 mile.

Ivybridge.—*Plymouth Borough Asylum.* Res. Med. Supt., W. H. Bowes, M.D. Access—Bittaford, ¼ mile; Wrangaton G.W.R., 1½ miles; Ivybridge, 3 miles.

Jersey.—*Cranbourne Hall,* Grouville. Med. Supt., A. C. Stamberg, M.D. Access—Grouville, 2 mins. walk.
See also p. 831

The Grove. Res. Med. Prop., F. N. Gaudin, M.R.C.S. 2½ miles from St. Heliers, 2 from St. Aubin's.

Jersey Asylum. Res. Med. Supt., Julius Labey, M.R.C.S. Access—Gorey Village, 1 mile.

Kilkenny.—*District Asylum.* Res. Med. Supt., Louis Buggy, L.R.C.P. Access—Kilkenny station, ¼ mile.

Killarney.—*District Asylum.* Res. Med. Supt., E. W. Griffin, M.D. Asst. Med. Off., G. W. Downing, L.R.C.P. & S. Access—Killarney, ½ mile.

Kirkintilloch (near Glasgow).—*Westermains Private Asylum.* For ladies.

Knowle (near Fareham).—*County Asylum.* Med. Supt., H. K. Abbott, M.D. Access—Knowle platform, ⅛ mile.

Lancashire, nr. Newton-le-Willows.—*Haydock Lodge,* Private Mental Hospital. Res. Med. Prop., Dr. C. T. Street. Access—Newton-le-Willows, 2 miles.

Lancaster.—*County Asylum.* Res. Med. Supt., D. M. Cassidy, M.D. Access—Lancaster, L. & N.W. and Midland stations, each 1¼ miles.

Leeds (near Menston).—*West Riding Asylum.* Res. Med. Supt., S. Edgerley, M.D. Access—Guiseley, 1 mile.

Leek (Stafford).—*County Asylum,* Cheddleton. Med. Supt., W. F. Menzies, M.D. Access — Wall Grange station, 1 mile.

Leicester.—*Borough Asylum,* Humberstone. Res. Med. Supt., J. F. Dixon, M.D. Access—Leicester.

Leicestershire and Rutland Asylum. Res. Med. Supt., R. C. Stewart, M.R.C.S. Access—Narborough, ¾ mile; Leicester, 7 miles.

Letterkenny.—*Donegal District Asylum.* Res. Med. Supt., E. E. Moore, M.D. Asst. Med. Off., J. C. Martin, L.R.C.S.I. Access—Letterkenny and Lough Swilly Rly., 1 mile.

Lichfield.—*County Lunatic Asylum,* Burntwood, near Lichfield. Res. Med. Supt., J. B. Spence, M.D. Access—Lichfield City, 3½ miles; Trent Valley, 4½ miles; Hammerwich, 1½ miles.

Limerick.—*District Asylum.* Res. Med. Supt., Dr. E. D. O'Neill. Access—Limerick station, ½ mile.

Lincoln.—*County Asylum,* Bracebridge. Res. Med. Supt., Dr. T. L. Johnston. Access—2½ miles from Lincoln G.N.R. station.

The Lawn. Res. Med. Supt., Arthur P. Russell, M.B. Access—Lincoln stat. 1 mile. *See also p.* 842

Liverpool.—*Shaftesbury House,* Formby, near Liverpool and Southport. Res. Med. Supt., Stanley A. Gill, B.A., M.D. Access—Formby station, ¼ mile distant. *See also p.* 839

Tue Brook Villa, Liverpool, E. Res. Med. Supts., Drs. Tisdall & Ingall. Access—Tue Brook station or Green Lane car. *See also p.* 849

London.—*Bethlem Royal Hospital,* Lambeth Road, London, S.E. Res. Med. Supt., W. H. B. Stoddart, F.R.C.P.; and Convalescent Home at Witley, Surrey. *See also p.* 844

Bethnall House, Cambridge Road, N.E. Res. Med. Supt., J. K. Will, M.D. Access—Cambridge Heath station. *See also p.* 848

Brooke House, Clapton, N.E. Props., Mr. H. T. Monro and Dr. J. O. Adams. Res. Med. Supt., Dr. Gerald Johnston. Access—Clapton, G.E.R.

Camberwell House, Peckham Road, S.E. Res. Med. Supt., F. H. Edwards, M.D., M.R.C.P. Asst. Med. Offs., G. H. Keene, B.A., M.D., B.Ch., and H. J. Norman, M.B., B.Ch., D.P.H. Telegrams, "Psycholia, London." Telephone, Hop. 1037. *See also p.* 844

Chiswick House, Chiswick. Res. Lics., Dr. T. S. Tuke and C. M. Tuke, M.R.C.S. Access—Chiswick station, ½ mile; Turnham Green station, 1 mile.

Clarence Lodge, Clapham Park, S.W. Prop., Mrs. F. Thwaites, B.A. Med. Off., Dr. Percy Smith. Access—Clapham Rd., and Clapham Common (Electric), 15 minutes. Tel. No. 494 Brixton. *See also p.* 848

Featherstone Hall, Southall (for ladies). Res. Med. Lic., W. H. Bailey, M.D. Access—Southall station, 5 minutes.

Fenstanton, Christchurch Road, Streatham Hill. Res. Med. Supt., T. Duncan Greenlees, M.D., F.R.S.E. Access—Tulse Hill, 5 minutes.

Flower House, Catford, S.E. Res. Med. Supt., Dr. C. C. Bullmore. Access—C. & D. R. Beckenham Hill, 5 minutes.

Halliford House, Sunbury-on-Thames, S.W. Res. Med. Supt., W. J. H. Haslett, M.R.C.S. Access—Sunbury station, 1¼ mile.

Hayes Park, Hayes, Middlesex, near Uxbridge. Res. Med. Off., Dr. J. W. Higginson. Access—Hayes, 2 miles.

Hendon Grove Asylum (for ladies), Hendon. Med. Lic., F. W. Edridge-Green, M.D., F.R.C.S. Access—By M.R., Hendon station, ½ mile, or 'bus from Tube at Golder's Green.

London County Asylum, Banstead Downs, near Sutton, Surrey. Res. Med. Supt., Dr. P. C. Spark. Access—Belmont station, ½ mile; Sutton station, 1½ miles.

London County Asylum, Bexley, Kent. Res. Med. Supt., T. E. K Stansfield, M.B. Access—Bexley station, 1¼ miles.

London County Asylum, Cane Hill, Coulsdon, Surrey. Res. Med. Supt., Sir J. M. Moody. Access—Coulsdon, S.E.R., or Coulsdon and Smitham Downs, L.B. & S.C.R., 10 minutes.

London County Asylum, Claybury, Woodford, Essex. Res. Med. Supt., Robert Jones, M.D. Access—Woodford station G.E.R., 1½ miles.

London County Asylum, Colney Hatch, N. Res. Med. Supt., S. J Gilfillan, M.B. Access — New Southgate, G.N.R.

London County Asylum, "*The Manor*", Epsom. Res. Med. Supt., W. Ireland Donaldson, M.D. Access—L. & S.W. and L.B. & S.C.R.

London County Colony (for Insane Epileptics), Ewell, Epsom. Res. Med. Supt., Dr. M. A. Collins. Access—L. & S.W. & L.B. & S.C.R. stations, 1½ miles.

London County Asylum, Hanwell. Res. Med. Supt., Dr. P. J. Baily.

London County Asylum, Horton, Epsom. Res. Med. Supt., Dr. J. R. Lord. Access—L. & S.W. Rly., 1½ miles, L.B. & S.C.R., 1¾ miles.

London County Asylum, Long-Grove, Epsom. Res. Med. Supt., C. H. Bond, M.D. Access—L. & S.W.R. and L.B. & S.C.R.

Middlesex County Asylum, Tooting, S.W. Med. Supt. H. Gardiner Hill, M.R.C.S. Access—Wandsworth Common station, 1 mile.

Moorcroft House, Hillingdon, Uxbridge, 2 miles; London, 13 miles. Med. Licensees, Dr. R. J. Stilwell, and Dr. R. H. Cole. Access—West Drayton station, 2 miles.

Newlands House, Tooting Bec Road, S.W. (for gentlemen). Prop. and Lic. Res. Med. Supt., Dr. J. Noel Sergeant. Access—Balham station, 1 mile, and tram.

See also p. 846

Northumberland House, Green Lanes, N. Prop., A. H. Stocker, M.D. Res. Med. Supt., Dr. Frank R. King. Access—Finsbury Park station, 1 mile. *See also p.* 845

Otto House, 47, North End Road, West Kensington (for ladies). Lic. Prop., A. H. Sutherland. Lady Supt., Mrs. Chapman. Access—West Kensington station, 1 mile; Barons Court station (Piccadilly Tube), 1 mile. *See also p.* 846

Peckham House, 112, Peckham Road, S.E. Props., Alonzo H. Stocker and H. G. Stocker. Res. Med. Supt., Harold C. Halsted, M.D. Access—Peckham Rye station, 10 minutes' walk.

See also p. 843

St. Luke's Hospital, Old St., E.C. Res. Med. Supt., Wm. Rawes, M.D., F.R.C.S. Convenient to principal London stations. *See also p.* 843

The Grange, East Finchley, N. Res. Licensees, Dr. F. and Mrs. Watson.

The Priory, Roehampton, S.W., near Richmond Park. Res. Med. Supt., James Chambers, M.D. Access—Barnes station, 10 mins.

West Ham Boro' Asylum, Goodmayes, Ilford. Res. Med. Supt., Dr. D. Hunter. Access—Goodmayes, ¾ mile.

Wood End House, Hayes (ladies). Uxbridge, 3 miles; London, 12 miles. Med. Lic., Dr. Stilwell. Access—Hayes station, 1 mile.

Londonderry.—*District Asylum.* Res. Med. Supt., Dr. Hetherington. Access—Londonderry, 1 mile.

Macclesfield.—*Parkside Asylum.* Res. Med. Supt., J. C. McConaghey, M.D. Access—Macclesfield, 1 mile.

Maidstone.—*Kent County Asylum.* Res. Med. Supt., H. W. Lewis, M.D. Access—Maidstone, 1½ miles.

West Malling Place, Kent, and *Winthies Cottage* (for ladies), and *Castle House* (for gentlemen). Res. Med. Supt., Dr. Adam. Access—Malling station, 1 mile.

Market Lavington (Wilts).—*Fiddington House.* Prop., Major Reilly. Res. Med. Supt., Dr. J. Selfe Lush. Access—Lavington, 1½; Devizes, 6 miles.

Maryborough (Queen's County).—*District Asylum.* Res. Med. Supt., Dr. P. Coffey. Access—Maryborough, ½ mile.

Melrose, N.B.—*Roxburgh District Asylum.* Res. Med. Supt., J. C. Johnstone, M.D. Access—Melrose, 1 mile.

Melton.—*Suffolk District Asylum*, near Woodbridge. Res. Med. Supt., J. R. Whitwell, M.B. Access—Melton station, 1¼ miles; Woodbridge station, 2½ miles.

Middlesbro'.—*County Boro' Asylum.* Res. Med. Supt., Dr. J. W. Geddes. Access—Middlesbro', 2 miles.

Monaghan (Ireland).—*District Asylum.* Res. Med. Supt., Dr. T. P. Conlon. Access—Monaghan, ¼ ml.

Montrose, N.B.—*Montrose Royal Lunatic Asylum.* Phys. Supt., John G. Havelock, M.D. Access—Hillside, ¼ mile; Dubton, 1 mile.

Morpeth.—*Northumberland County Asylum.* Res. Med. Supt., Thos. W. McDowall, M.D. Access—Morpeth station, 1 mile, by 'bus.

Mullingar.—*District Asylum.* Res. Med. Supt., Dr. A. Finegan. Access—Mullingar station, 1 mile.

Nelson (Lancs.).—*Marsden Hall.* Licensee and Med. Supt., P. G. Mould, M.R.C.S. Access—Nelson station, L. & Y. Rly.

Newcastle-on-Tyne.—*City Asylum*, Gosforth. Res. Med. Supt., James T. Callcott, M.D. Access—Newcastle, 4 miles.

Northampton.—*Berrywood Asylum.* Res. Med. Supt., W. Harding, M.D. Access—Castle station, 2½ miles; Midland station, 3 miles.

St. Andrew's Hospital. Med. Supt., J. Bayley, M.R.C.S. Access—Northampton station, 1 mile.

Norwich.—*Heigham Hall.* Res. Phys. and Prop., J. G. Gordon-Munn, M.D. Access—Victoria station, 1 mile. Thorpe station, 1½ miles.

Norfolk County Asylum, Thorpe, Norwich. Res. Med. Supt., D. G. Thomson, M.D. Access—Whitlingham, 1 mile; Norwich, 2½ miles

Norwich City Asylum, Hellesdon, near Norwich. Res. Phys. and Supt., Dr. David Rice. Access—Hellesdon, 1 mile.

The Bethel Hospital for the Insane. Res. Med. Supt., S. J. Fielding, M.B. Cons. Phys., Saml. J. Barton, M.D. Access—Norwich (Thorpe) station, 1 mile. *See also p.* 841

The Grove, Old Catton, near Norwich.—(For ladies only.) Res. Med. Supt., C. A. Osburne, F.R.C.S. Apply to the Misses McLintock.

Nottingham.—*City Asylum,* Mapperley Hill. Med. Supt., E. Powell, M.R.C.S.

Notts County Asylum. Med. Supt., S. L. Jones, M.R.C.S. Access—Radcliffe-on-Trent, 2 miles.

The Coppice. Res. Med. Supt., W. B. Tate, M.D. Access—Midland station, 2½ miles; Gt. Northern & Gt. Central station, 1½ miles.

Omagh.— *District Asylum.* Res. Med. Supt., Geo. E. Carre, M.B. Access—Omagh station, 1½ miles.

Oxford.—*Oxford County Asylum.* Res. Med. Supt., T. S. Good, M.R.C.S. Access—Littlemore station.

The Warneford, Oxford, 1½ miles. Res. Med. Supt., James Neil, M.D. Access—Oxford station, 2¼ miles. *See also p.* 847

Paisley.—*Lunatic Ward,* Poorhouse, Craw Road. Vis. Med. Off., Hugh C. Donald, M.D.; Res. Med. Off., Winifred M. Ross, M.B., Ch.B., Access—Paisley, 1 mile.

Paisley District Asylum, Riccartsbar. Med. Off., D. Fraser, M.D. Access—Paisley West, ¼ mile.

Perth.—*District Asylum,* Murthly. Res. Med. Supt., Lewis C. Bruce, M.D. Access—Murthly.

James Murray's Royal Asylum, Perth (for private patients only). Phys. Supt., A. R. Urquhart, M.D., F.R.C.P. Ed. Access—Perth station, under 2 miles. *See also p.* 844

Plympton. — *Plympton House,* Plympton, South Devon. Res. Props., Dr. Alfred Turner and Dr. J. C. Nixon. Access—Plympton, 1 mile; Marsh Mills, 2 miles; Plymouth, 5 miles. *See also p.* 846

Portsmouth.—*Borough Asylum.* Res. Med. Supt., B. H. Mumby, M.D., D.P.H. Access—Fratton, 1½ miles. *See also p.* 845

Prestwich (nr. Manchester).—*County Asylum.* Res. Med. Supt., Dr. F. Perceval. Acc.—Prestwich, 1 mile.

Rainhill (near Liverpool).—*County Asylum.* Res. Med. Supt., J. Wiglesworth, M.D. Access—St. Helens, 2½ miles; Rainhill, 1 mile.

Rotherham (Yorkshire).—*The Grange,* 5 miles from Sheffield (for ladies). Con. Phys., W. C. Clapham, M.D. Res. Phys., G. E. Mould, M.R.C.S., L.R.C.P. Access—Grange Lane station, G.C.R., ½ mile. *See also p.* 847

St. Albans (Hill End).—*Herts County Asylum.* Med. Supt., A. N. Boycott, M.D. Access—Hill End station, G.N.R., 2 minutes.

St. Leonards-on-Sea.—*Ashbrook Hall,* Hollington (for ladies). Res. Lics., Mr. and Mrs. Charles Somerset. Med. Supt., Dr. J. Farrant Fry. Access—Warrior Square station, 2 miles.

Salisbury.—*Fisherton House Asylum.* Med. Supt., Dr. R. T. Finch. Access—Salisbury station, 5 minutes.

Laverstock House. Res. Med. Supt., R. C. Monnington, M.D. Access—Salisbury, 1½ miles.

Sevenoaks (Kent).—*Riverhead House* (for ladies). Res. Med. Supt., Dr. Wm. H. C. Macartney. Access—Sevenoaks station, S.E.R., ¾ mile.

Shrewsbury.—*Salop & Montgomery Counties Asylum.* Res. Med. Supt., D. F. Rambaut, M.D. Access—Shrewsbury station, 2½ miles.

Sleaford.—*Kesteven County Asylum.* Med. Supt., J. A. Ewan, M.A., M.D. Access—Rauceby, G.N.R., ¼ mile.

Sligo.—*District Asylum.*—Res. Med. Supt., Dr. Joseph Petit. Access—Sligo station, 1½ miles.

Stafford.—*County Asylum.* Res. Med. Supt., Dr. J. W. S. Christie. Access—Stafford, 1 mile.

Institution for the Insane, Coton Hill. Res. Med. Supt., Dr. R. W. Hewson. Access—Stafford, 1 mile. *See also p.* 841

Starcross (near Exeter).—*Western Counties Training Institution for the Feeble-minded.* Res. Supt., E. W. Locke. Access—Starcross station, G.W.R., 5 minutes.

Stirling.—*District Asylum,* Larbert. Med. Supt., Dr. R. B. Campbell. Access—Larbert, 1½ miles.

Stone (near Aylesbury). — *Bucks County Asylum.* Res. Med. Supt., H. Kerr, M.D. Access—Aylesbury station, 3¼ miles.

Tamworth (Staffs.).—*The Moat House* (for ladies). Res. Prop., E. Hollins, M.A., J.P. Access — Tamworth station, ¾ mile. *See also p.* 850

Taunton.—*Somerset & Bath Asylum*, Cotford, near Taunton. Res. Med. Supt., Dr. H. T. S. Aveline. Access —Norton Fitzwarren station, 2 miles.

Ticehurst (Sussex).—*Asylum.* Props., Drs. H. & A. Newington. Access—Ticehurst Road, 3 miles; Wadhurst S.E. & C.R., 4 miles.

Tonbridge. — *Redlands.* Res. Med. Supt., W. A. Harmer, L.S.A. Access —Tonbridge junc., S.E. & C.R., 2½ miles.

Virginia Water. — *Holloway Sanatorium*, Hospital for the Insane. St. Ann's Heath. Res. Med. Supt., W. D. Moore, M.D. Asst. Med. Offs., T. E. Harper, L.R.C.P., G.W. Smith, M.B., C. E. C. Williams, M.D., Sylvia R. M. Blackstone, M.B. Access—Virginia Water station, 5 mins. Seaside Branch, " St Ann's," Canford Cliffs, Bournemouth. Med. Off., E. Rivaz Hunt, M.D. *See also p.* 848

Wadsley (near Sheffield). — *South Yorkshire Asylum.* Res. Med. Supt., W. S. Kay, M.D. Access—Wadsley Bridge, 1 mile.

Wakefield. — *West Riding Asylum.* Res. Med. Supt., J. Shaw Bolton, M.D. Access—Kirkgate and Westgate station, 1 mile.

Wallingford (Berks).—*Berkshire Asylum.*—Res. Med. Supt., J. W. A. Murdoch, M.B. Access—Cholsey 1 mile.

Warlingham (Surrey). — *Croydon Mental Hospital.* Res. Med. Supt., E. S. Pasmore, M.D. Access—Croydon, 6 miles; Upper Warlingham, 3¼ miles. *See also p.* 840

Warwick.—*Midland Counties Institution*, Knowle, near Birmingham (for feeble-minded children). Sec. and House Gov., A. H. Williams. Med. Off., J. O. Hollick, M.B., M.R.C.S. Access—Knowle, ½ mile.

Waterford.—*District Asylum.* Res. Med. Supt., J. A. Oakshott, M.D. Access—G. S. & W. R., North station, 2 miles.

St. Patrick's Institution, Belmont Park. Conducted by the Brothers of Charity. Med. Supt., W. R. Morris, M.B.

Wells.—*Somerset and Bath Asylum*, Wells, Som. Res. Med. Supt., Dr. G. Stevens Pope. Access—Wells station, 1½ miles; Masbury station, 2½ miles.

Whitchurch (Salop). — *St. Mary's House* (ladies only). Res. Med. Supt., C. H. Gwynn, M.D. Access—Whitchurch, 1 mile.

Whitefield (near Manchester).—*Overdale.* Res. Phys., P. G. Mould, M.R.C.S. Access—Prestwich and Whitefield station, 1½ miles; Molyneux Brow, ¼ mile.

Whittingham (nr. Preston). —*County Asylum.* Res. Med. Supt., Dr. J. F. Gemmel. Access—Grimsargh station, 1¾ miles; Whittingham station, 3 minutes.

Winchelsea (Sussex).—*Periteau*, near Hastings (5 ladies). Prop., Mrs. R. V. Skinner. Med. Supt., E. W. Skinner, M.D. Access—Winchelsea station, 1 mile.

Witham (Essex). — *The Retreat* (for males). Licensee, Dr. H. E. Haynes. Res. Med. Supt., Dr. J. P. Race. Access—Witham station. ½ mile.

Woking. — *Surrey County Asylum*, Brookwood. Res. Med. Supt., J. A. Lowry, M.D. Access—Brookwood station, 1¼ miles.

Worcester.—*County & City Lunatic Asylum*, Powick. Res. Med. Supt., Dr. G. M. P. Braine-Hartnell. Access—Worcester station, 4 miles.

York.—*The Pleasaunce* (ladies only). Prop. & Med. Supt., G. I. Swanson, M.D. Access—York, 1½ miles. *See also p.* 841

The Retreat. Res. Med. Supt., Bedford Pierce, M.D., F.R.C.P. (Lond.). Access—York station, 1½ miles. Also Throxenby Hall, a branch house, near Scarborough. *See also p.* 840

Bootham Park Registered Hospital, York. Res. Med. Supt., C. K. Hitchcock, M.D., M.A. Cantab. Access—York station, 1 mile.

North Riding of Yorkshire Asylum, Clifton. Res. Med. Supt., A. I. Eades. Access—York, 2 miles.

TRAINING INSTITUTIONS.

Bath.—*Magdalen Hospital School* (for idiot and imbecile children). Med. Off., D. L. Beath, M.R.C.S. Clerk, E. N. Fuller, LL.B., 5, Old King St., Bath. Access—G.W.R., 1½ ml.

Bristol.—*Stoke Park Colony*, Stapleton (for mentally defective children). Apply to Secretary, National Institutions for Persons requiring Care and Control, 14, Howick Place, Westminster, S.W. *See also p.* 810

Dublin.—*Stewart Institution*, Palmerston, Chapelizod, Co. Dublin (for imbecile children). Med. Supt., Dr. F. E. Rainsford.

Dundee.—*Baldovan Institution* (for the treatment and education of the feeble-minded). Matron, Miss Henry, Med. Supt., D. M. Greig, F.R.C.S. Access—Baldovan, 1 mile.

Lancaster.—*The Royal Albert Institution* (for the feeble-minded of the Northern Counties; 715 patients). Res. Med. Supt., Dr. A. R. Douglas. Secretary, Saml. Keir. Access—Lancaster station, 1 mile; and *Brunton House*, a Private Home in connection with the Royal Albert Institution.

See also p. 850

Larbert (Stirlingshire).—*Scottish National Institution* (for education of imbecile children). Med. Supt., Dr. R. D. Clarkson. Sec. & Treas., A. J. Fitch, Virginia Buildings, Glasgow. Access—Larbert station, ¾ mile.

SANATORIA FOR CONSUMPTION AND OTHER FORMS OF TUBERCULOSIS.

Aberchalder (N.B.).—*Inverness-shire Sanatorium.* Med. Supt., D. S. Johnston, M.D. Access—Aberchalder, 2 miles.

Aysgarth, S.O. (Yorks).—*Wensleydale Sanatorium.* Med. Supt., Edwd. M. Hime, M.B., Ch.B. Access—Aysgarth, ½ mile, via Northallerton, N.E.R., and Hawes Junction, M.R. *See also p.* 828

Banchory (Scotland).—*Nordrach-on-Dee.* Res. Phys., D. Lawson, M.A., M.D. Access—Banchory station, 1½ miles.

Barrasford (Northumberland).—*The Newcastle-on-Tyne and Northumberland Sanatorium.* Res. Med. Off., Dr. W. C. Rivers. Access—Barrasford, N.B.R., 4 miles.

Belbroughton (Worcs.).—*Bourne Castle Open-air Sanatorium.* Apply Res. Phys., W. Bernard Knobel, M.D. Access—Hagley, G.W.R.; Bromsgrove, M.R. *See also p.* 831

Benenden (Kent).—*Sanatorium* of "National Association for the Establishment and Maintenance of Sanatoria for Workers suffering from Tuberculosis." Two Res. Med. Officers. Apply, Secretary. Access—Biddenden station, 3 miles.

Bingley (Yorks.).—*Eldwick Sanatorium* (for women and children). Vis. Phys., Dr. Margaret Sharp. Access—Bingley station, 2 miles.

Bolton (Lancs).—*Wilkinson Sanatorium for Consumptives.* Med. Off., Dr. J. D. Marshall. Sec., F. Nightingale, 12, Acresfield Road, Bolton.

Bournemouth.—*Royal National Sanatorium for Consumption and Diseases of Chest.* Sec., A. G. A. Major. Res. Phys., Dr. Henry Holroyd. Access—Bournemouth station, 1 mile. Terms 7/6 per week and a Governor's nomination.

The Firs Home (for advanced cases). Hon. Sec., Colonel R. F. Anderson, Bournemouth. Hon. Med. Offs., P. J. Duncan, M.D., and S. G. Champion, M.D. Lady Supt., Miss MaGuire. Access—Bournemouth Central, ½ mile.

The Home Sanatorium, West Southbourne, near Bournemouth. Res. Med. Supt., J. E. Esslemont, M.B., Ch.B. Access—Bournemouth Central, 2½ miles; Boscombe, 1½ miles; Christchurch, 2½ miles.

See also p. 828

Bridge of Weir (Renfrewshire).—*Consumption Sanatoria of Scotland.* Hon. Treas., J. P. Maclay, Esq., 21, Bothwell Street, Glasgow. Med. Supt., John Guy, M.D. Access—Bridge of Weir, 2 miles.

Brighton.—*Municipal Sanatorium*, for Brighton townsfolk. Objects: educational, and for treatment of both early and advanced cases. Med. Supt., Dr. Duncan Forbes, M.O.H. for Brighton. Particulars, Town Hall, Brighton.

Broadstairs, Thanet.—*Eastcliff House* (Home Sanatorium for Children suffering from tuberculous glands, bones, joints, etc). Res. Surg., Dr. C. C. Chidell. *See also p.* 831

Chagford (Devon).—*Dartmoor Sanatorium* (near Exeter, Newton Abbot, and Okehampton). Res. Med. Supt. and Prop., Dr. A. Scott Smith. Access—Moretonhampstead, G.W.R., 6 miles; Okehampton station, L. & S.W.R., 11 miles. *See also p.* 830

Cheddar (Somerset).—*Engel Home*, (for gentlewomen and girls). Med. Supt., R. W. Statham, M.R.C.S. Apply to Lady Supt. Access—Cheddar station, 10 minutes.

Cheltenham.—*Cotswold Sanatorium.* Cons. Phys., Dr. F. K. Etlinger. Address—Cotswold Sanatorium, near Stroud.

Salterley Grange Sanatorium, near Cheltenham. Res. Med. Supt., Dr. A. K. Traill. Access—Leckhampton, 2½ miles.

Chesterfield (Derbyshire).—*The Ashover Sanatorium.* Med. Supt., Dr. Ida E. Fox. Access—Stretton, M.R., 3½ miles. *See also p.* 831

Darlington.—*Felix House*, Middleton St. George, Co. Durham. Med. Supt., C. S. Steavenson, M.B. Access—Dinsdale, N.E.R., 5 mins. *See also p.* 828

Devon and Cornwall *Sanatorium.* Didworthy, South Brent. For consumptive poor of the two counties. Hon. Sec., S. Carlile Davis, Esq., Princess Chambers, Princess Sq., Plymouth. Res. Med. Supt., Dr. W. B. Livermore. Access—Brent, G.W.R., 2 miles.

Doneraile (Co. Cork).—*Cork County and City Sanatorium*, Heatherside. Res. Med. Supt., Dr. R. Ahern. Access—Buttevant, 5 miles.

Dorking (Surrey).—*Woodhurst Sanatorium* (for women and children), Tower Hill. Sec., Mrs. G. Wright. Visiting Phys., Miss Mary R. McDougall, M.B., C.M.Ed. Access—L.B. & S.C.R. and the S.E. stations, both about 1½ miles.

Dundee (near), *Sidlaw Sanatorium*, Res. Med. Off., Dr. H. E. Watson. Access—Auchterhouse stat. 1½ mls.

Durham.—*Durham County Consumption Sanatoria.* Sec., Mr. F. Forrest, 54, John Street, Sunderland. Terms free and by payment. For men: Stanhope, Med. Supt., Dr. John Gray. Access—Stanhope station, 1 mile. For women and girls: Wolsingham, Med. Supt., Dr. Menzies. Access—Wolsingham station, ¾ mile.

Edinburgh.—*Royal Victoria Hospital for Consumption* (for the treatment of poor patients). Visiting Physicians, Dr. R. W. Philip and Dr. G. L. Gulland. Clerk and Treasurer, 42, Castle Street, Edinburgh.

Woodburn Sanatorium, Morningside. Res. Med. Prop., Mrs. I. Mears, L.R.C.P.I.

Eversley (Hants).—*Moorcote Sanatorium.* Res. Med. Supt., J. G. Garson, M.D. Access—Wellington College station, 4½ miles; Wokingham sta., 6 miles; Fleet, 6 miles.

Farnham (Surrey).—*Crooksbury Sanatorium.* Res. Phys., Dr. F. Rufenacht Walters. Access—Farnham station, 3½ miles; Tongham, 2½ miles; Ash, 4 miles. *See also p.* 829

Whitmead Sanatorium. Tilford. Res. Phys., J. Hurd-Wood, M.D. Access—Farnham station, 3½ miles.

Fortbreda, Belfast.—*Forster Green Hospital for Consumption and Chest Diseases.* Res. Phys. Dr. C. J. Alexander. Sec., H. Osborne, Scottish Provident Building, Belfast. Access—Belfast, 2 miles, Mainly for the poor; 6 beds free; others by small payment.

Frimley (Surrey).—*Brompton Hospital Sanatorium.* Res. Med. Supt., Dr. Marcus Paterson. Access—Frimley station, 2 miles.

Grange-over-Sands.—*Westmorland Sanatorium.* Res. Med. Supt., Dr. G. D. H. Wallace. Access—Grange-over-Sands station, 2¾ miles.

Hastings.—*Fairlight Sanatorium,* in connection with Margaret Street Hospital for Consumption and Diseases of the Chest (for Out-Patients), 26, Margaret Street, London, W. Sec., Alice M. Greg. Med. Off., Dr. N. F. Stallard. Access—Hastings, Tram, about 15 minutes. Payments; by subscriber's letter, 11/6, without, 17/6.

Heswall (Cheshire). — *West Derby, Liverpool, and Toxteth Park Joint Sanatorium.* Med. Supt., J. B. Yeoman, M.D.

Hull.—*Hull and East Riding Convalescent Home,* Withernsea. Sec., Benjamin Brooks, Royal Infirmary, Hull. Med. Off., A. E. Sproulle, L.R.C.P. Access—Withernsea stat.

Isle of Wight. — *Royal National Hospital for Consumption,* Ventnor. Senr. Res. Med. Off., Dr. James C. Gilchrist. Sec., Ernest Morgan, 18, Buckingham Street, Strand, W.C. Terms 10/– per week and a recommendation from a Governor. Access—Ventnor, 1 mile.

St. Catherine's Home, Ventnor (for advanced cases). Apply to the Sister-in-Charge. Med. Off., H. F. Bassano, M.A., M.B. Access—Ventnor, 5 mins. drive. Terms, by selection, 10/6 per week.

Kinross-shire (Scotland).—*Coppin's Green Sanatorium and Ochil Hills Sanatorium,* Milnathort. Access.—Kinross junction, 4 miles.

Kirkcaldy. — *Sanatorium for Consumption.* Med. Supt., Dr. G. W. McIntosh. Sec., The Town Clerk.

Lanark.—*Bellefield Sanatorium.* Res. Med. Supt., Dr. J. W. Allan. Access—Lanark, 20 minutes.

Lanchester (Durham).—*Maiden Law Sanatorium.* Med. Off., Dr. W. M. Morison. Sec., W. H. Ritson.

Leeds.—*Leeds Sanatorium for Consumptives,* Gateforth, near Selby, and *Leeds Hospital for Consumptives,* Armley. Sec., C. H. Sedgwick, 37, Great George St., Leeds. Terms free, for poor of Leeds.

Liverpool.—*Liverpool Sanatorium for Consumptives,* Kingswood, Frodsham. Sec., Liverpool Hospital for Consumption, Mount Pleasant, Liverpool. Res. Phys., Dr. H. H. Thomson. Access—Frodsham station, L. & N.W.R., 3½ miles.

Llanybyther (Carmarthenshire). — *West Wales Sanatorium.* For the Counties of Carmarthen, Cardigan, and Pembroke. Res. Med. Supt., Dr. H. O. Blanford. Access—Llanybyther station, 3 miles.

London.—*City of London Hospital for Diseases of Chest,* Victoria Park, E. Open-air treatment provided. Res. Med. Off., Dr. W. W. Jameson, Sec., Geo. Watts. Access—Cambridge Heath, G.E.R., 5 minutes.

Mount Vernon Hospital for Consumption and Diseases of the Chest, Hampstead. Access—Finchley Road (Met.) station, 1 mile. *Country Branch Hospital at Northwood.* Access—Northwood (Met. & G.C. Rly.) Hon. Vis. and Res. Staff. Free on recommendation of governors. Secretary, W. J. Morton.

Royal Hospital for Diseases of the Chest, 231, City Road, E.C. Med. Off., Dr. R. M. Hiley. Apply to the Secretary.

Long Stratton (Norfolk).—*Fritton Sanatorium,* The Beeches. Med. Director, Dr. Annie McCall, 165, Clapham Road, S.W. Access—Forncett station, G.E.R., 4 miles.

Manchester.—*Hospital for Consumption and Diseases of Throat and Chest.* Hospital at Bowdon; Crossley Sanatorium, Delamere, Cheshire. (For poor and working classes, after personal examination at Manchester.) Sec., C. W. Hunt, Manchester. Res. Phys. (Bowdon), Dr. D. P. Sutherland; (Delamere), G. Heathcote, L.R.C.P., & S. Access—Bowdon: Altrincham station, ½ mile. Delamere: Mouldsworth or Frodsham, 3½ miles.

Margate (Kent).—*Royal Sea-bathing Hospital* (for Surgical Tuberculosis). Sec., A. Nash, 13, Charing Cross, S.W. Access — Margate West, ¼ mile.

Mendip Hills.—*Mendip Hills Sanatorium*, Wells, Somerset. Res. Phys., D. J. Chowry Muthu, M.D. Access—Wells station, 2¾ miles.

See also p. 829

Nordrach-upon-Mendip, Blagdon, near Bristol. Res. Phys., R. Thurnam, M.D. Access—Burrington station, 5 miles.

Midhurst (Sussex).—*King Edward VII Sanatorium*. Res. Med. Supt., N. D. Bardswell, M.D. Access—Midhurst, 4 miles.

Nayland (Suffolk). — *East Anglian Sanatorium*, and *Maltings Farm Sanatorium* for poor men and women patients. Med. Supt., Dr. Jane Walker, 122, Harley Street, W. Access—Bures station, G.E.R., 3½ miles.

New Cumnock (Ayrshire).—*Ayrshire Sanatorium*, Glenaften. Res. Med. Supt., E. E. Prest, M.D. Access—New Cumnock, 3 miles.

Norfolk.—*Kelling Sanatorium*, Holt. Assistance given to poor patients unable to pay. Hon. Sec., Dr. H. W. McConnel. Res. Med. Supt., Mr. J. I. W. Morris. Access—Holt station, 1½ miles.

Mundesley Sanatorium, Mundesley. Res. Physician, S. Vere Pearson, M.B. Access—Mundesley station, 1 mile.

Northallerton (Yorks). — *Ruebury Sanatorium*, Osmotherley. Res. Med. Prop., H. B. Luard, F.R.C.S. Access—Northallerton, N.E.R., 8 miles, Trenholme Bar, 4 miles.

See also p. 830

Northampton.—*Northamptonshire Sanatorium*. Creaton. Res. Med. Supt., Dr. J. A. Kilpatrick.

Nottingham.—*Ransom Sanatorium*, Sherwood Forest, Mansfield, for persons of limited means, resident in Notts and district. Res. Med. Off., Dr. Lina M. Potter. Access—Mansfield, 3 miles. Free on recommendation of subscribers.

Oban, Scotland. — *Argyll County Sanatorium*. Vis. Med. Off., Duncan MacDonald, M.D. Hon. Sec., Roger McNeill, M.D. Access—Oban, 1 mile.

Ockley *Sanatorium* (Surrey). Res. Phys., Dr. Clara Hind. Access—Ockley, L.B. & S.C.R., 1 mile.

Painswick (Glouc'stershire).—*Painswick Sanatorium*, Cotswold Hills. Res. Phys. and Prop., W. McCall, M.D. Access—Stroud, 4 miles; Gloucester, 6 miles.

Peebles.—*Manor Valley Sanatorium*. Res. Phys., Dr. Harley.

Penmaenmawr (N. Wales).—*Nordrach in Wales, Pendyffryn Hall*. Res. Phys., Dr. G. Magill Dobson.

Peppard Common (Oxon).—*Kingwood Sanatorium*, for ladies; *Maitland Sanatorium*, for working classes. Med. Supt., Dr. Esther Carling. Access—Reading station, 6½ miles.

Ringwood (Hants). —*Linford Sanatorium*. Props. and Res. Phys., R. M. Smyth, M.D., H. G. Felkin, M.D., and A. de W. Snowden, M.D. Access—Ringwood station, 2½ mls.

Rudgwick (Sussex). — *Rudgwick Sanatorium*. Vis. London Phys., Dr. Annie McCall. Access—Rudgwick station, 5 minutes; Horsham station, 7 miles.

Ruthin (N. Wales).—*Vale of Clwyd Sanatorium, Llanbedr Hall*. Res. Prop., Dr. G. A. Crace-Calvert. Access—Ruthin station, 2 miles.

See also p. 830

St. Leonards.—*Eversfield Chest Hospital*, West Hill. Sec., Hubert W. Green. Res. Phys., T. Gambier, M.D. Fee, 10/- weekly, with subscriber's letter, available 4 weeks. Access—West St. Leonards S.E.R., West Marina L.B. and S.C.R., within 5 minutes' walk.

Sandon, near Chelmsford (Essex).—*Merivale Sanatorium*. Res. Phys., H. N. Marrett, M.R.C.S. Access—Chelmsford stat., G.E.R., 3½ miles.

Sheffield. — *City Hospitals for Consumptives* (for males), Commonside; (and for females), Crimicar Lane. Med. Supt., H. J. E. H. Williams, M.D.

Shirlett, near Broseley (Shropshire). — *King Edward VII Memorial Sanatorium*. Med. Supt., Dr. F. H. Pearce.

Skipton (Yorks).—*Eastby Sanatorium*, for males. Conducted by Bradford Board of Guardians. Med. Supt., B. H. Slater, F.R.C.S. Res. Med. Off., Dr. E. Beales. Access—Embsay station, 2 miles.

Stannington (Northumberland). — *"Philipson" Children's Sanatorium.* Matron, Miss D. G. Wilson.

Threlkeld (Cumberland). — *Blencathra Sanatorium.* Res.Med. Supt., Dr. W. Goodchild. Access—Threlkeld, C. K. & P. R., 2 miles.

Torquay.—*Mildmay Consumption Home* for advanced cases only. Hon. Med. Offs., F. D. Crowdy, M.D., and H. P. Wiggin, M.R.C.S. Hon. Sec., Miss F. Gumbleton, Connemara, Torquay. Access—Torquay, 1 mile. Fees, 10/6 weekly, or 7/- with subscriber's letter.

Western Hospital, Torquay. Open Oct. to May. Sec., F. Manley. Terms, 7/6 weekly by nomination, 12/6 without.

Warrenpoint (Co. Down).—*Rostrevor Sanatorium.* Res. Phys., B. H. Steede, M.D. Access—Warrenpoint. *See also p.* 828

Wicklow.—*The Royal National Hospital for Consumption for Ireland,* Newcastle, Wicklow. Hon. Sec., J. R. Orpen, 13, South Frederick Street, Dublin. Res. Med. Off., Dr. Chas. D. Hanan. Access—D. & S.E.R. to Newcastle, Co. Wicklow, 3 miles. Minimum fees, 7/- weekly, on subscriber's recommendation and medical examination.

Winsley, near Bath.—*Winsley Sanatorium.* For residents in the Counties of Bristol, Gloucester, Somerset and Wilts. Res. Med. Off., Leonard Crossley, M.D. Sec., Frederic Jones. Access—Limpley Stoke station, 1 mile.

Wokingham.— *London Open-air Sanatorium,* Pinewood. Sec., H. W. Harris, 20, Hanover Square, W. Access—Wellington College, S.E.R., 2 miles; or Wokingham, S.W.R., 3½ miles.

Yelverton (South Devon). *Udal Torre Sanatorium.* Res. Med. Supt. and Prop., J. Penn Milton, M.R.C.S.

INSTITUTIONS FOR INEBRIATES.

LICENSED UNDER THE ACTS, 1879–1900.

The patient must sign a Form expressing a wish to enter the Home, before a magistrate. This can be done at the private residence of the patient, or at the retreat, if previous notice has been given. Two friends must also sign a declaration that they consider the patient an "Inebriate" within the meaning of the Acts.

* NOTE:—Ashford is a Roman Catholic Religious Institution.

† Cinderford, Herne Hill, Terrington St. Clement, and Torquay, are C.E.T.S. Institutions.

MALES ONLY.

Buntingford (Herts). — *Buntingford House Retreat.* Two Res. Physicians. Access — Buntingford, G.E.R., 8 minutes. *See also p.* 834

Cinderford† (Glos.).—*Abbotswood House Inebriate Retreat.* Res. Hon. Supt., F. Eardley-Wilmot. Med. Off., Dr. Creswell. Access—Ruspidge or Cinderford. *See also p.* 836

Cockermouth (Cumberland).—*Ghyllwoods.* Res. Med. Prop., Dr. J. W. Astley Cooper. Access—Cockermouth, 11 miles. *See also p.* 832

Colinsburgh (Fife).—*Invernith Lodge.* Res. Med. Supt. and Licensee, Dr. W.H.Bryce. Access—Kilconquhar station, 4½ miles. *See also p.* 833

Folkestone.—*Capel Lodge,* near Folkstone. Res. Prop., E. Norton, M.D. Access — Folkestone Junction, 2 miles. *See also p.* 832

Rickmansworth (Herts).—*Dalrymple House.* Res. Med. Supt., F. S. D. Hogg, M.R.C.S., L.R.C.P. Access—Rickmansworth station, Great Central & Metropolitan Railway, ½ mile; L. & N.W.R., 1 mile. *See also p.* 834

FEMALES ONLY.

Ashford, near Staines.*—*Ecclesfield.* Med. Supt., Dr. M. F. Cock. Apply to the Mother Superior. Access—Ashford station, 1 mile. *See also p.* 831

Belfast. — *The Lodge Retreat,* Irwin Avenue, Strandtown. Med. Supt., R. W. Leslie, M.D.

Beverley (E. Yorks).—*Albion House.* Res. Supt., the Matron. Hon. Sec., Mrs. T. R. Pentith, The Limes, Sutton - on - Hull. Hon. Phys., Geo. Savege, M.D.

Brighton.—*Park Gate*, Preston Road. Lady Supt., Sister Mary. Med. Off., R. J. Ryle, M.D., J.P.

Dairsie, by Cupar (Fife).—*Invereden Sanatorium.* Res. Phys., Dr. J. Q. Donald. Access—Cupar station.

Erdington, nr. Birmingham.†—*Corngreaves Lodge.* Access—Gravelly Hill station, ¼ mile. *See also p.* 836

Fallowfield. — *The Grove Retreat*, near Manchester. Licensee, Mrs. M. Hughes. Med. Offs., A. T. Wilkinson, M.D., J. W. Hamill, M.D., G. Ashton, M.D., and Dr. Florence Robinson. Hon. Treas., S. Gamble. Access—Fallowfield station, 10 minutes. *See also p.* 835

Herne Hill.†—*Ellison Lodge*, Half Moon Lane. Res. Supt., Miss Corner. Med. Supt., Dr. T. H. Underhill. Access—Herne Hill, 10 minutes; North Dulwich, 3 minutes. Telephone: 1162 Brixton. *See also p.* 836

Leicester.—*Melbourne House*, Prop., Mr. H. M. Riley. Med. Attendant, R. Sevestre, M.A., M.D., Camb. London Consultant, W. Wynn Westcott, M.B. (Coroner N.E. London), 396, Camden Road, Holloway. Dublin Consultant, Sir Wm. J. Smyly, M.D., F.R.C.P.I., 58, Merrion Square, Dublin Nat. Tel., 769 Leicester. Station, 2 miles. *See also p.* 832

Newmains (N.B.).—*Newmains Retreat* for ladies. Licensed under Inebriates Acts. Access—Hartwood stat., Cal. Railway. *See also p.* 835

Reigate (Surrey). — *Duxhurst*, for women of all classes. Supt., Sister in charge. Med. Supt., A. Walters, M.R.C.S. Access—Reigate, 4 miles. *See also p.* 835

Spelthorne St. Mary (Bedfont, Middlesex). — Apply to Sister Superior, C.S.M.V. Access—Feltham, S.W.R., 1 mile.

Licensed under Inebriates Acts. Females—Primarily Gentlewomen and Middle Class (24). Treatment—Physical, Moral, and Spiritual.

See also p. 835

Terrington St. Clement† (Norfolk). —*Hamond Lodge.* Res. Supt., the Sister in Charge. Med. Supt., S. R. Lister, M.R.C.S. Access—Terrington station, 1½ miles.

See also p. 836

Torquay.† — *Temple Lodge.* Res. Supt., Sister in Charge. Med. Off., W. Odell, M.D., F.R.C.S. Hon. Sec., Mrs. H. H. Erskine.

See also p. 836

Wandsworth. — *Northlands Retreat*, 20, Bolingbroke Grove, Wandsworth Common, S.W. Lics., Dr. J. Round and the Misses Round. Access — Wandsworth Common station, L.B. & S.C.R.

REFORMATORIES CERTIFIED UNDER THE INEBRIATES ACT, 1898.

Male and Female.

Bristol.—*Brentry certified Inebriate Reformatory*, Westbury-on-Trym. Res. Supt., Capt. Lay; Med. Officer, Dr. Ormerod. Hon. Sec., Rev. H. N. Burden. Access—Clifton Down, Redland, or Patchway station, 3½ miles.

Cattal (Yorkshire).—*Yorkshire Inebriate Reformatory*, Cattal, near York. For Yorkshire cases. Res. Supt. and Med. Off., Dr. F. P. Hearder. Access—Cattal, 1 mile.

Females Only.

Ackworth (Yorkshire).—*North Midlands Inebriate Reformatory.* Res. Supt., the Officer in Charge. Med. Off., Dr. Oyston. Access—Ackworth station, 1½ miles.

Bristol.—*Royal Victoria Home.* Horfield. Med. Off., Dr. John Ambrose. Hon. Sec., Rev. H. N. Burden. Access—Montpelier and Bristol stations.

Chesterfield (Derbyshire).—*Midland Counties Inebriate Reformatory*, Whittington. Med. Off., Dr. A. M. Palmer. Access — Whittington station, ½ mile; Chesterfield, 5 miles.

East Harling (Norfolk). — *Eastern Counties Inebriate Reformatory*, East Harling, near Thetford. Res. Med. Supt., Dr. Fleck. Access—Harling Road station, 3½ miles.

Horley (Surrey).—*Farmfield.* For London cases, under Sec. II of the Act. Res. Supt., Miss Forsyth. Med. Off., Dr. C. F. Williamson. Access—Horley station, 2½ miles.

Langho (Lancashire). — *Lancashire Inebriate Reformatory*, Langho, near Blackburn. For Lancashire cases. Res. Supt. and Med. Off., Dr. F. A. Gill. Access—Langho station, 1½ miles.

UNLICENSED HOMES.

Beckenham (Kent).—*Norwood Sanatorium*, The Mansion, Beckenham Park. Med. Supt., F. Hare, M.D. Phys., H. L. Ewens, M.D. Prop., Access—Beckenham Junc. station, 10 minutes. *See also p.* 836

Carnoustie (N.B.)—*The Lodge.* Apply to the Secretary.

Durham. — 24, Allergate, for friendless and inebriate women; 4/- per week. Hon. Sec., Miss King. Med. Supt., Dr. Smith. Access—Durham. ½ mile.

Edinburgh. — *Queensberry Lodge*, for ladies. Supt., A. Miller. Med. Supt., Dr. William Russell. Access—Waverley station, ½ mile. *See also p.* 836

Harrogate (Near).—*Hill House*, Starbeck, Yorks., for women. Apply, Matron. Med. Off., Dr. Petch. Access—Starbeck station, ½ mile.

Heybridge, (Essex). — *Osea Island*, for ladies and gentlemen. Res. Phys., H. L. Ewens, M.D. Prop., F. N. Charrington, Esq.

Hounslow (Middlesex).—*West Holme*, for middle-class and working women. Med. Supt., Dr. G. A. S. Gordon. Access—S.W. & Dist. Rly., ¼ mile.

Liverpool.—*Temperance Home*, 318 Upper Parliament Street, for women. Supt., Miss A. J. Wilson. Med. Officer, C. E. Soloman, M.D. Access—Edge Hill station.

HYDROPATHIC ESTABLISHMENTS.

We wish to make this list complete, but it is impossible when some Proprietors do not return our letter of enquiry, which is *stamped for reply*. This will account for some omissions in the present edition.

Aberdeen. — *Deeside Hydropathic*, Murtle, near Aberdeen. Access—Rail to Aberdeen, thence to Murtle station on the Deeside line.

Baslow. — *Grand Hotel and Hydro.* Access—Bakewell station, 4½ miles; Grindleford, 5 miles.

Ben Rhydding. — *Ben Rhydding Hydro.* Phys., Thos. Scott, M.D., and Dr. W. R. Bates. Access—Station, a few hundred yards.

Bexhill-on-Sea.—*Wilton Court Hotel and Hydro.* Proprietress. Mrs. Sewell.

Bournemouth (Hampshire).—*Bournemouth Hydropathic.* Res. Phys., W. J. Smyth, M.D. Access—East station, 1½ mile; West station, ¼ mile.

Bridge of Allan.—*Bridge of Allan Hydropathic Co.* Manageress, Mrs. Gregory. Access—Station, ¼ mile.

Bristol. — *The Bristol Hydropathic* (formerly Bartholomew's Turkish Baths), College Green. Res. Phys., W. J. Spoor, M.B., M.R.C.S.

Bute.—*Kyles of Bute Hydropathic*, Port Bannantyne, Rothesay. Man., A. Menzies. Med. Supt., Dr. A. J. Hall. Access—Clyde steamers call daily.

Buxton.—*Buxton Hydro.* Manager, G. W. Bosworth. Access—Station, 4 minutes.

Corbar Hill Hydro. Clarendon House. Man., Miss L. Adams. Access—Buxton station, 5 minutes.

Haddon Hall Hydro, Buxton. Managing Director, John Little. *See also p.* 812

The Peak Hydro Hotel. Apply Manageress. Access—Buxton station. *See also p.* 823

Caterham (Surrey). — *Surrey Hills Hydropathic.* Res. Med. Supt., A. B. Olsen, M.D. Access—Caterham station. *See also p.* 811

Clifton (near Bristol).—*Clifton Grand Spa and Hydropathic.* Access—Clifton Down station, 1 mile; Bristol station, 1½ miles.

Cork.—*St. Ann's Hill Hydropathic.* Res. Phys., M. Orb, M.D., Erlangen (Germany). Access—Blarney sta., 2½ miles; Muskerry Light Railway from Cork, station on grounds.

Crieff. — *Strathearn House* (17 miles from Perth). Res. Med. Supts., Thos. H. Meikle, M.D., J.P., and T. Gordon Meikle, M.B., C.M. Access—Crieff station, 1 mile.

Dunblane.—*Philp's Dunblane Hydropathic*, Perthshire. Res. Phys., Dr. S. M. Sloan. Access—Dunblane station, ¾ mile.

Eastbourne. — *Eastbourne Hydropathic.* Manager, W. J. Grimes. Access — Eastbourne station, 5 minutes' drive.

Edinburgh.—*Hydropathic*, Slateford. Man. Director, J. Bell. Access—Merchiston, 1 mile; Waverley, 3 miles.

Forres.—*Cluny Hill Hydropathic.* Vis. Phys., Dr. John Adam. Access—Forres station, 1 mile; Inverness, 24 miles.

Grange-over-Sands. — *Hazelwood Hydropathic.* Physicians, Richard Lowther, M.D., and Owen Gwatkin, M.R.C.S. Access—Carnforth, L. & N.W.R., and thence by Furness Railway; Grange-over-Sands, ¼ mile.

Harrogate (Yorkshire).—*The Cairn Hydropathic.* Man., Mrs. Baker. Access—Harrogate station, ½ mile.

The Harlow Manor Hydro. Man., Miss Oakley. Access—Harrogate, 1 mile.

The Harrogate Hydropathic. Phys., Drs. T. Johnstone and R. McLeod Veitch. Access—Harrogate station, ½ mile.

Hexham (Northumberland).—*Tynedale Hydropathic.* Prop., F. G. Grant. Med. Supt., Dr. Stewart. Access—Hexham, 1 mile; Newcastle, 19 miles.

Ilfracombe.—*The Cliffe Hydro.* Med. Supt., Chas. W. E. Toller, M.D. Apply to the Secretary. Station, 1 mile. *See also p.* 814

Ilkley (Yorkshire). — *Craiglands Hydro., Lim.* Res. Med. Supt., Henry Dobson, M.D., C.M.

The Spa Hydropathic, near Leeds and Bradford. Manageress, Mrs. Robertson. Med. Supt., Dr. T. B. Hearder. Access—Ilkley, 3 mins.

Leicester.—*The Leicester Sanitarium*, 82, Regent Road. Med. Supt., A. B. Olsen, M.D.

Limpley Stoke (near Bath).—*West of England Hydropathic.* Access—Limpley Stoke station.

London. — *Nevill's Turkish Baths*, Charing Cross, W.C., and York Terrace, Marylebone Road, N.W. Light Baths, Douches, Sulphur and Electric Baths, Vibro-Massage, etc. *See also p.* 826

Malvern.—*The Malvern Hydropathic.* Res. Prop., Dr. J. N. F. Fergusson. Access—Great Malvern station, ¼ mile. *See also p.* 820

Wyche-side Hydropathic. Access—Malvern Wells station, G.W.R., ½ mile; Great Malvern station, 2 miles.

Matlock. — *Matlock House Hydropathic.* Matlock. Physician, W. Moxon, M.D., J.P. Access—Matlock, M.R., ¼ mile.

Rockside Hydropathic, Matlock. Med. Supts., Drs. Marie Goodwin (Resident) and Dr. Morton. Access—Matlock, ¾ mile. *See also p.* 818

Royal Hotel and Baths, Matlock Bath. Phys., W. C. Sharpe, M.D. Access—Matlock Bath station.

Smedley's Hydropathic, Matlock. Res. and Vis. Physicians. Access—Matlock station, ½ mile; omnibus. *See also p.* 817

Melrose. — *Waverley Hydropathic.* Access—Melrose station, 1 mile. *See also p.* 812

Moffat. — *The Moffat Hydropathic.* Man., Miss Gardner. Med. Supt., Dr. Huskie. Access—Moffat station, 1 mile.

Peebles.—*Peebles Hotel Hydropathic.* Complete modern equipment of baths and electrical treatment. Plombières treatment for mucous colitis. Fango di Battaglia (Mud packs for sciatica, etc.). Res. Phys., Thomas D. Luke, M.D., F.R.C.S.Edin. *See also p.* 813

Rothesay. — *Glenburn Hydropathic.* Med. Supt., Dr. Marshall. Access —Wemyss Bay, ½ hour's sail.

Scarborough.—*Seacroft Hydropathic and Hotel.* Telephone 401. *See also p.* 810

Shandon. — *Shandon Hydropathic.* Consulting Phys., Dr. Wm. R. Sewell. Access—Shandon station, 5 mins.

Skelmorlie. — *Wemyss Bay Hydropathic.* Med. Supt., Dr. W. C. Philp. Access—Wemyss Bay station, ½ mile. *See also p.* 822

Southport (Birkdale Park).—*Smedley Hydropathic.* Phys., J. G. G. Corkhill, M.D. Southport or Birkdale stations. *See also p.* 812

Kenworthy's Hydropathic, 51, Bath Street. Phys., Dr. Kenworthy. Access—Chapel Street (L. & Y.), Lord St. station (Cheshire Lines), ¼ mile.

Tunbridge Wells.—*The Spa Hotel.* Access—Station, about 1 mile; London, 34 miles. Apply, Manager. *See also p.* 811

Ulverston.—*Conishead Priory Hydropathic.* Med. Supt., Dr. Ashburner. Access — Ulverston station, 1¾ miles.

NURSING INSTITUTIONS AND PRIVATE HOMES FOR INVALIDS.

NURSING INSTITUTIONS.

Bournemouth.—*Victoria Nurses' Institute*, Cambridge Road. Matron, C. Forrest. Access—Bournemouth West station. *See also p.* 808

Bristol.—*General Hospital.* Matron, Miss A. Densham. Sec., Wm. Thwaites. Access—Temple Meads station, G.W.R. and M.R., ¾ mile. *See also p.* 806

Cheltenham. — *General Hospital* Private Nursing Staff. Matron, Miss G. Möller. *See also p.* 804

Leamington.—*Private Nursing Association*, Radford Road; also Surgical and Medical Home. Apply, Mrs. J. Ward. *See also p.* 808

Leeds.—*Trained Nurses' Institution*, 21, Hyde Terrace. For Trained Nurses and Masseuses. Apply, Superintendent.

London. — *Blackheath Nursing Institution*, 9, Montpelier Row, Blackheath, S.E. Lady Principal, Miss Duncan.

National Hospital Male Nurses' Association, Queen Square, W.C. Apply to Lady Superintendent. Tel. No. 4594 Central. *See also p.* 806

St. Luke's Hospital, Old Street, E.C. Trained Nurses for Mental, Nervous and Massage Cases. Apply Matron. *See also p.* 806

Temperance Male Nurses' Co-operation, Ltd., 43, New Cavendish Street, W.; also at Manchester and Glasgow. Secretary, M. D. Gold. *See also p.* xlviii.

Minehead (Som.). — *Minehead Trained Nurses' Institute.* Apply, Matron. *See also p.* 810

Sunderland. — *Nursing Inst. and Home for Trained Nurses.* Matron, Miss C. Aldis.

Thoroughly reliable Nurses supplied for Medical, Surgical, Mental, and Maternity cases.

York.—*The Retreat* (Trained Nurses' Department, for mental and nervous cases only). *See also p.* 840

PRIVATE HOMES FOR INVALIDS.

Alderley Edge (Cheshire). — *The David Lewis Colony* (for Sane Epileptics), and *Colthurst House School* (for Epileptic Boys). Director, Alan McDougall, M.D. Access —Warford, near Alderley Edge.
See also p. 809

Alverstoke (Hants). — *South Coast Nursing Home*, 9 and 10, Linden Grove. Apply, Mrs. Heather.
See also p. 800

Bath.—*Lansdown Hospital and Nursing Home*, Bath (invalids only; special arrangements for patients suffering from gout, rheumatism, and physical infirmities). Med. Supts., Dr. Percy Wilde, and Dr. Wells-Beville. Access—M.R. or G.W.R. station, Bath, about 1 mile.
See also p. 801

Widcombe Hill Nursing Home, 3, Widcombe Crescent, Bath. Trained nursing under medical supervision. Apply to Lady Superintendent.
See also p. 810

Billericay (Essex).—*New Lodge* (for gentlemen suffering from slight mental defect), and *Leon House* (for epilepsy). Conducted by the Co-operative Sanatoria, Ltd.
See also p. 808

Bournemouth. — *St. Luke's Homes* for Epileptic Churchwomen, 36, Parkwood Rd.; also at Swanmore, Ryde, I.W. Med. Supts., Dr. Hosker, Boscombe; A. Banks, F.R.C.S., Ryde.
See also p. 809

Victoria Nursing Institute and Home, Cambridge Road (for paying patients). Apply the Matron.
See also p. 808

Chorley Wood (Herts).—*The Laburnums*, Heronsgate. Private Home for epileptic, paralytic, and other cases. Apply, Miss King. Access —Chorley Wood station, 1½ miles.
See also p. 809

Croydon (Surrey).—*Campbell House.* "Rest Cure" in neurasthenia, insomnia, and mild lung and chest complaints. Apply to the Matron.
See also p. 810

Erdington.—*Rosevale Private Nursing Institution*, Penns Lane. Rest Cure, Massage, etc. Apply, Miss C. L. Fallows. Access—Chester Road station, ¼ mile.
See also p. 801

Folkestone. — *Springwood*, Cheriton Gardens. Home for delicate children. Apply, Miss G. M. Shand, Cert. I.S.T.M.
See also p. xlvi.

Hadlow Down, Buxted (Sussex).—*South Beacon* (for the care and treatment of gentlemen mentally affected, but not ill enough to be certified). Prop., Philip H. Harmer. Access—Buxted, 3 miles; Mayfield, 4 miles; Heathfield, 4 miles.
See also p. 808

Haslemere, Surrey.—*Haslemere Nursing Home, "Courtsfold."* Medical, Weir-Mitchell, Rest-Cure, and Chronic cases received. Apply to the Misses Rattray and Moore. Tel. No. 22.
See also p. 804

Jedburgh.—*Abbey Green.* Res. Prop., Wm. Blair, M.D. Access—N.B.R., Jedburgh. Telephone No. 3.
See also p. 809

Leicester. — *Frith Home of Rest*, Groby Road, near Leicester. Chronic cases or convalescents; nerve cases. Apply to Lady Superintendent.
See also p. 805

London. — *Home for Invalids of Limited Means*, 7 & 9, Holy Innocent's Road, Hornsey, N. Lady Supt., Miss M. Hodgson. Tel., 672 Hornsey.
See also p. 805

Manna Mead, 17, The Grove, Blackheath, S.E. (for invalids and convalescents). Principals, Mrs. Knight and Miss Tapley Spurr. Access—Lewisham Junction, 15 mins'. walk.
See also p. 805

St. Thomas's Home, St. Thomas's Hospital, Westminster Bridge. Apply, Sydney Phillips, B.A., St. Thomas's Hospital, S.E. Access —Waterloo, 5 minutes. Tel.: Hop. 1637.
See also p. 807

Malvern (West).—*Hazelwood*, West Malvern. Slight mental, retarded development, or aged. Apply, Miss Brogden.
See also p. 803

Minehead (Som.). — *Blair Lodge*, Private Nursing Home and Trained Nurses' Institute. Medical supervision (non-resident). Apply to Sisters Heather. Access—Station, 10 mins. *See also p.* 810

New Brighton.—*Convalescent Home for Women and Children.* Hon. Treas. and Sec., Frank Holt, Esq., 8, Cook Street, Liverpool. Lady Supt., Miss E. S. Hallam. *See also p.* 807

Reigate Hill (Surrey).—*The Beeches*, Wray Lane. Nerves, Rest Cure, Massage, Electricity, Diet. Apply, Miss Goslett. *See also p.* 808

Ryde (Isle of Wight). — *Crescent House* (for treatment of paralysis, neurasthenia, osteo-arthritis, and neuralgia. Apply, Dr. G. M. Lowe. *See also p.* 804

Southwold (Suffolk).—*Avenue House* (Invalid Home). Apply to Miss Gibbs. *See also p.* 810

Stanmore (Middlesex). — SCARLET FEVER *Convalescent Home* (*The Mary Wardell*). Vis. Phys., A. Muir, M.D. Hon. Sec., Miss M. Wardell. Access—Stanmore, 2 miles, and tramcars. *See also p.* 807

Tunbridge Wells.—*Mount Ephraim Nursing Home*, 8, Molyneux Park. Medical, Surgical, Weir-Mitchell, and Massage cases. Excellent facilities for open-air treatment. Apply, Miss Baxter. Access—Station, 10 mins. *See also p.* 809

Westcliff-on-Sea.—*St. Ursula*, King's Road. Surgical and Medical Home. Apply, Miss Haslock. *See also p.* 811

PRINCIPAL BRITISH SPAS,

WITH INDICATIONS FOR THEIR THERAPEUTICAL EMPLOYMENT.

Bath (Somerset).—Sheltered from the N. and N.E. winds by a range of hills from 600 to 800 feet high; 2 hours from London (Paddington), 12 miles from Bristol. Average rainfall 30·79 inches. Climate mild and equable.

Waters.—The only hot springs in Great Britain. Three springs yield over half a million gallons of water daily, the temperature of the hottest being 120° F. The waters contain sulphates of calcium, strontium, sodium, and potassium, with calcium carbonate, the chlorides of magnesium, sodium, and lithium, etc.

Therapeutic indications.—Gout, chronic rheumatism, rheumatoid arthritis, sciatica, disorders of the digestive organs, anæmia, skin diseases, nervous disorders and debility.

Baths.—Modern baths of every description, including Aix massage douche, deep baths, electric, water and hot air, natural vapour, needle, intestinal douches for muco-membranous colitis and similar conditions, sulphur, Nauheim, and Zander medico-mechanical treatment.

Nursing and Baths.—Lansdown Grove House (*See p.* 801); and Widcombe Hill Nursing Home (*See p.* 810).

Bridge of Allan (Stirlingshire).—Three miles north of Stirling. Sheltered from the North and East winds by the Ochil Hills. On the direct route to London, and within an hour's rail journey of Edinburgh and Glasgow. Average rainfall 33·24 inches. Climate mild and equable all the year.

Waters.—Natural mineral waters from six springs at a depth of about 110 feet, exceedingly rich in saline, the chief ingredients being various salts of calcium, sodium, and magnesium. These waters are once more coming into great prominence.

Therapeutic indications.—Chronic affections of the liver, stomach, and bowels, in many chest diseases, and in rheumatism, gout, sciatica, and other nerve affections, also diseases of the skin.

Baths.—Excellent suite of baths, with skilled attendants.

Buxton (Derbyshire).— 1000 feet above sea level, 3½ hours from London (St. Pancras), 23 miles from Manchester, 30 from Sheffield, 53 from Liverpool. Bracing climate. Lowest absolute humidity of any health resort in Great Britain.

Waters.—Thermal springs 82 F. Powerful radio-active properties. More highly charged with nitrogen gas than any other spring. Chalybeate spring.

Therapeutic indications.—Gout, rheumatism, rheumatoid arthritis, sciatica, nervous diseases, skin diseases, especially those of gouty origin, malaria and other tropical diseases, colitis, anæmia, phlebitis, and diseases of women.

Baths.—Over 70 different treatments. Every proved treatment installed. Recent official report of Devonshire Hospital gives percentage of cures as 88·6 per cent extending over last five years.

Hydropathic Establishments.—Haddon Hall Hydro. (*See p.* 812) ; and The Peak Hydro Hotel (*See p.* 823).

Cheltenham (Gloucestershire). — 250 feet above sea level, 3 hours from London. Rainfall about 31 inches. Protected from N. and N.E. winds.

Waters.—The mineral waters are of two kinds. One is alkaline from contained soda carbonate, the other is impregnated with the sulphates of soda and magnesia. They are now receiving considerable attention from the medical profession, and seem likely to successfully compete with Carlsbad and Marienbad in attracting a portion of the patients formerly sent abroad.

Therapeutic indications.—Gout, dyspepsia, dietetic disorders generally, neurasthenia, and other conditions.

Baths.—Good modern baths, with massage.

Nursing—Cheltenham General Hospital (*See p.* 804).

Church Stretton (Salop).— 613 feet above sea level, in the "Highlands of England," 4¼ hours from Euston, 3¾ hours from Paddington, 1½ hours from Birmingham, 2½ hours from Liverpool and Manchester, and 2½ hours from Bristol. Air noted for its extreme purity, bracing, with a somewhat tranquillizing influence, and a generally invigorating climate. Hills 1250 to 1700 feet high. Prevailing wind, S.W. Rainfall, 32 inches. Modern drainage. Porous soil.

Waters.—Said to be the purest in England ; useful in gout, rheumatism, chronic renal affections, and arteriosclerosis.

Therapeutic indications.—Specially the "open-air" cure of neurasthenia, for sequelæ of influenza, insomnia, functional nervous diseases, chronic gout and rheumatism, chronic gastric and bronchial catarrh, debility from overwork and convalescence after illness or operation. A good 'after-cure' resort from Bath, Buxton, Cheltenham, Droitwich, Leamington, and Llandrindod Wells.

Droitwich (Worcestershire). — 150 feet above sea level, 2½ hours from London (Paddington), 19 miles from Birmingham, 6 from Worcester. Rainfall 23 inches. Mean winter temperature 47° F., summer 69·9° F. Well protected from N. and N.E. winds.

Waters.—The most powerful saline in the world. The brine is pumped from 200 feet below the ground level. Temperature 54° F., and is heated by introducing steam. It is 10 to 12 times as strong as that of the ocean (channel), containing in every gallon 20,000 grains of saline in excess of any known waters : the waters possess radio-active properties.

Therapeutic indications.—Chronic muscular and articular rheumatism, rheumatoid arthritis, chronic articular or irregular gout, neuritis, sciatica, neuralgia, heart diseases, especially those of myocardium—effect similar to Nauheim treatment—neurasthenia, anæmia, chlorosis, some sclerotic diseases of spinal cord, skin diseases of a dry, scaly nature, e.g., chronic eczema and psoriasis.

Baths.—Immersion, douche, needle, vapour, swimming, Aix-douche, Nauheim baths, etc.

Hotel.—Worcestershire Brine Baths Hotel, and Brine Baths (*See p.* 816)

Harrogate (Yorkshire). — 450 feet above sea level, 4 hours from London, 17 miles from Leeds, 20 from York. The climate is stimulating and fairly dry—bracing moorland air.

Waters.—Celebrated for the medicinal properties of its 80 springs—sulphurous, chalybeate, alkaline, saline, etc.

Therapeutic indications.—Anæmia, chlorosis, gout, rheumatism, disorders of liver and stomach, muco-membranous colitis, chronic appendicitis, and skin diseases.

Baths.—There are four establishments, where numerous treatments are given, including sulphur baths, douche, Nauheim, vapour, Russian, Turkish, electric, mineral, electric light, ozone, throat and nasal, etc.

Ilkley (Yorkshire).—Situated on the southern slope of the valley of the Wharfe, rising rapidly from the bank of the river to a height of 1320 feet above sea level; distant 16 miles from Leeds, 14 from Bradford, and 18 from Harrogate. Occupying a sheltered position. The annual rainfall, 35 inches, is considerably less than on the other side of the river, with fewer rainy days. Mean annual temperature 48° F. Death-rate 8 per 1000. Being in close proximity to extensive moors the air is bracing and exhilarating and at the same time dry and soft, having a wonderfully restorative effect upon invalids such as Anglo-Indians and delicate children, and convalescents.

Waters.—The water supply obtained from springs is remarkably pure, bright and sparkling. Chalybeate waters. Saline.

Therapeutic indications.—Gout, rheumatism, neuritis, neurasthenia, anæmia, asthma, and bronchitis cases are benefited. The treatment adopted is that known as hydro-therapeutic.

Baths.—Complete suites of baths are to be found in the numerous establishments. Electrical, Weir-Mitchell.

Leamington Spa (Warwickshire).—170 feet above sea level, 1 hour 30 minutes from London (Paddington or Euston), 24 miles from Birmingham. Equable and mild climate.

Waters.—Saline. Resembling those of Homburg, but are more generally useful.

Therapeutic indications.—Muscular and articular rheumatism, gout, rheumatoid arthritis, neuralgia and neuritis, diseases arising from a plethoric condition of the chylopoietic viscera, eczema and other irritative disorders of the skin, conditions of increased vascular tension and chronic interstitial nephritis.

Baths.—Turkish, medicated, swimming, and electric of all kinds (*See also p.* 815).

Nursing Institution.—Private Nursing Association (*See p.* 808).

Llandrindod Wells (Radnorshire). — Situated in Central Wales, at an altitude of 750 feet. About 5 hours from London on the L. & N.W. Ry. It lies in the centre of a plateau of hills rising in places to over 2000 feet. Sheltered from the east, and open to the south and west. The soil is porous, and dries up quickly after rain. The climate is extremely bracing.

Waters.—There is a great variety of mineral waters—saline, sulphurous, iron, magnesium, chloride of calcium, and lithia springs similar in composition to those at Kissengen and Homburg. Slightly aperient and strongly diuretic.

Therapeutic indications.—The diseases most benefited are those in which any digestive derangements are present, the various forms of gout and rheumatism, rheumatoid arthritis, neuritis and fibrositis, gall-stones and biliary stasis, renal calculus, or any kidney or bladder condition requiring diuresis, neurasthenia, or debility from over-work or convalescence.

Llangammarch Wells (Breconshire). — In an open valley surrounded by moorland, 600 feet above sea level. On the L. and N.W. Ry., $5\frac{3}{4}$ hours from London, 4 from Manchester, $4\frac{1}{2}$ from Liverpool. Mean annual temperature 47·5° F., summer 55·4° F. Well protected from the east.

Water.—Saline, containing the chlorides of barium, calcium, magnesium, lithium, and sodium; the only one of its kind in the British Isles. The barium salt has a physiological action on cardiac muscle similar to that of digitalis and strophanthus, and is also a good diuretic. Administered both internally and externally. Temperature 56° F.; is heated for bathing purposes. A modified Nauheim system of baths, exercises, massage, and hill climbing is carried out.

Therapeutic indications.—Cardiac diseases, organic and inorganic, especially affections of the myocardium due to influenza. Graves' disease, chronic muscular and articular rheumatism, osteo-arthritis, gout, sciatica, and neurasthenia.

Baths.—Immersion, douche, and needle.

Malvern (Worcestershire).—Situated at a mean altitude of 500 ft. above sea level, on eastern slope of Malvern Hills (9 miles long and rising to 1400 ft.), 2½ hours from London (Paddington), and about 1 hour from Birmingham. Original home of hydropathy. Soil gravelly (syenitic detritus). Air dry and bracing, cool in summer and warm in winter. Average rainfall 22·12 inches. Mean annual temperature 49·58, with low daily variation. Lowest death-rate of any inland watering place. Sanitation perfect. (*See also p.* 820).

Waters.—Mainly spring, of remarkable purity, free from organic matter, less than 4 grains of earthy salts per gallon.

Therapeutic indications.—Gout, rheumatism, rheumatoid arthritis, neuralgia, sciatica, lumbago, dyspepsia, constipation, anæmia, bronchial, nephritic, and cutaneous diseases.

Baths.—Natural pure brine, Turkish and electric baths, Vichy massage and Aix douches, Fango-di-Battaglia.

Hydropathic Establishment.—Dr. Fergusson's Hydropathic (*See p.* 820).

Nursing Home.—Hazelwood, West Malvern (*See p.* 803).

Matlock Bath (Derbyshire).—300 to 800 ft. above sea level, 3½ hours from London (St. Pancras), 46 miles from Manchester, 16 from Derby. Rainfall 29 inches. One of the most sheltered towns in England.

Waters.—Thermal Springs. Mild sulphated alkaline—saline waters at 68° F., containing 33 grains per gallon of salts, mainly magnesium and calcium bicarbonate, and magnesium sulphate. Owing to its peculiarly soft and unctuous character it is especially valuable in bathing and douche operations, particularly those associated with massage, such as those known as the "Aix" and "Vichy" douches.

Therapeutic indications.—Rheumatism, gout, rheumatoid arthritis, neuritis, neurasthenia, catarrhs (bronchial, gastric, or enteric), anæmia, cardiac asthenia, chronic diseases of the liver or kidneys, and digestive and bilious disorders.

Baths, etc.—A complete modern installation exists for the administration of all kinds of baths, douches, packs, and other hydropathic treatment, electricity, massage, inhalations, Nauheim baths, with Swedish exercises.

Fango-di-Battaglia.—The volcanic mineral deposit from the hot springs near Padua (N. Italy) is imported, and extensively used in the treatment of gout, rheumatoid arthritis, and neuritis.

Matlock Bank (*Matlock* station, one mile by rail from Matlock Bath).—300 to 800 feet above sea level, 3½ hours from London (St. Pancras), 45 miles from Manchester, 17 from Derby. South-westerly aspect, and well sheltered from the north. Climate mildly bracing. Sunshine above the average. The Matlock system of hydropathic treatment is carried out in all its branches, and the principal Hydros are installed with latest electric baths and appliances, including high-frequency, Dowsing radiant light and heat, Schnee four-cell, X rays, etc. They also include Turkish, Russian, plunge, medicated and inhalation baths, Aix and Vichy douches, etc.

A feature of the Matlock Hydros is, that as a rule they are complete in their own grounds, and contain croquet and tennis lawns, and bowling and

putting greens, which, as a means of recreation and exercise, form a valuable auxiliary to a course of hydropathic treatment.

Hydropathic Establishments.—Rockside Hydropathic (*See p.* 818) and Smedley's Hydropathic (*See p.* 817).

Peebles (Peebleshire, N.B.). — 500 ft. above sea level. One hour from Edinburgh and 8 from London (via Galashiels). Rainfall 27 inches. Bracing climate but sheltered from the north winds. Mean annual mortality rate 11 per mil. Population 6000 in winter, and 10,000 in summer.

Waters.—The waters are of the halothermal type, similar to Kissengen and Kreuznach. The chief ingredient is chloride of sodium. They are obtained from the famous St. Ronan's Well.

Therapeutic indications.—The waters are specially suited to the Nauheim and Bourbon Lancy treatment of cardiac disease, and in this respect seem likely to compete with the above-mentioned continental resorts, patients being saved the long journey, and also, after the baths, are conveyed by lift immediately to their rooms for resting. The waters are also suited to dyspepsia, gout, rheumatism and neurasthenia.

Baths.—The baths at the hydropathic are of the most modern type. Complete electrical installation and mud baths (Fango di Battaglia).

Hydropathic Establishment.—Peebles Hotel Hydropathic (*See p.* 813).

Ripon (Yorkshire). — Situated on rising ground near the junction of the Rivers Ure and Skell. On the N.E. Railway, $4\frac{3}{4}$ hours from London. 120 feet above sea level. Climate mild but bracing. Soil, gravel and sand, and dries up quickly after rain. Prevailing winds, W. and S.W. Surrounding country well wooded and very beautiful, Fountains Abbey and many other places of interest being within easy reach. The Yorkshire Moors are only a few miles from the City.

Waters.—Saline Sulphur Water brought down from Aldfield Spa, 4 miles distant to the New Baths erected in 1904.

Therapeutic indications.—Chronic and subacute gout and rheumatism, rheumatoid arthritis, skin diseases (eczema, psoriasis, acne, etc.), catarrhs gastric and liver derangements.

The Baths have been lately equipped with up-to-date electric apparatus for electric treatments (*See also p.* 814).

Strathpeffer Spa (Ross-shire).—In the Highlands of Scotland. 180 to 300 feet above sea level. Through carriages twice a week during summer from London, 15 hours. Sheltered from N. and N.E. winds. Prevailing wind S.W. Sandy soil. Bracing air.

Waters.—Sulphurous and chalybeate. Former, very rich in sulphuretted hydrogen gas and sulphates. Four sulphur wells in use: (1) Old well; (2) Upper; (3) Strong; (4) Cromartie. No. 4 contains over 19 cubic inches H_2S to gallon. Sulphates the predominating salt. Have strong diuretic and mild aperient action.

Therapeutic indications.—Chronic and subacute gout and rheumatism (especially articular), rheumatoid arthritis, chronic skin diseases (eczema, acne, psoriasis, etc.), especially when gouty or rheumatic, chronic disorders of the digestive system, chronic gastric or intestinal catarrh, sluggish portal circulation, congested liver, biliary and urinary calculi, neurasthenia, anæmia, obesity, chronic metallic poisoning, dilatation of heart, neuritis.

Baths.—Sulphurous (immersion), inhalation, peat, douche (Aix and Vichy), needle, pine, Russian, Nauheim, radiant heat (electric), and high-frequency current.

Hotel.—The Ben Wyvis Hotel (*See p.* 821).

Tunbridge Wells (Kent).—400 feet above sea level, 1 hour from London, 30 miles from Hastings, Brighton, and Eastbourne. Rainfall 30 inches. Mean winter temperature 41·3° F., summer 55·9° F. Lies upon a bed of sandstone. Climate is mildly tonic and invigorating. Prevailing winds W. and S.W.

Waters.—Chalybeate spring, containing 4 grains ferrous carbonate to the gallon, with sulphates and chlorides of potash, soda, and calcium.

Therapeutic indications.—Diseases of respiratory organs (bronchitis, asthma, and phthisis), early cardiac cases, diseases of digestive organs, gout and rheumatoid arthritis, and especially diseases of nervous system (neurasthenia and mental depression), as well as in convalescence and infantile disorders. Waters indicated in anæmia, chlorosis, and allied conditions.

Baths.—Immersion, douche, needle, Turkish, Russian, vapour and swimming, medicated and electric light. (*See p.* 811).

Nursing.—Mount Ephraim Nursing Home (*See p.* 809).

Hotel.—The Spa Hotel (*See p.* 811).

Woodhall Spa (Lincolnshire).—Built upon ironstone sand, through which the rain percolates very rapidly. Midway between Boston and Lincoln, about 3 hours from London (King's Cross), through carriages 4 p.m. Rainfall 22 inches. Air bracing, and uncontaminated, from moors and pine woods. Excellent new water supply.

Waters.—Bromo-iodine waters, rich in the chlorides of sodium, calcium, and magnesium, with bromine and iodine.

Therapeutic indications.—Rheumatism (chronic articular and muscular), lumbago, arthritis deformans, gouty arthritis, sciatica, neuritis, paralysis, neurasthenia; injuries to joints; skin diseases, psoriasis, urticaria; diseases and tumours peculiar to women; diseases of throat and nose; liver disorders.

Baths.—Recently enlarged. Immersion, shower, undercurrent and local douches; Aix and Vichy douche massage; Nauheim, electric and Schnee baths; Dowsing radiant heat and light baths; nose, throat and eye mineral sprays and douches; Russian and Berthollet vapour; electric ionic and X-ray treatments; massage and Swedish exercises. Particulars, apply Medical Superintendent.

Hotels.—Hotel Victoria (*See p.* 822), and Royal Hotel (*See p.* 823).

Helouan, Egypt.—Sixteen miles from Cairo by train, 200 feet above the Nile, which is about three miles from the town. Celebrated for its wonderfully dry and warm yet bracing climate, the amount of sunshine in the Winter months, and its convenient position for seeing many of the antiquities of Egypt. The amount of bright sunshine from November to March averages 8·3 hours a day, as against 1·4 in London. The diurnal variations are small, the air is fresh by day and night and very free from dust. The average annual rainfall is about $\frac{3}{4}$ of an inch.

Waters.—Strong sulphur waters, which are used internally and externally in various ways, but especially in the Helouan Bath, in which massage is given while a stream of water at the desired temperature passes freely through the bath. This water rises at a temperature of 91° F.

Therapeutic indications.—Gout, rheumatism, the various forms of arthritis, fibrositis and neuritis, neurasthenia, chronic nephritis, and generally for those requiring a dry, warm climate, not relaxing, for the winter months.

Fully equipped Zander Institute, including electrical treatment and baths.

Hotel.—The Al Hayat Hotel (*See p.* 827).

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	St. Thomas's Hospital	26, Bessborough Gardens	*
	Tolmers Square Institute, Drummond St., N.W.	*J. Loane, M.R.C.P.*, 13, Great Alie Street, E.	Monday ; 1
	Eastern Disp., Leman St.		Wednesday ; 11
	Christ Church Mission Hall, Shroton St., Marylebone	E. C. Greenwood, L.R.C.P., 19, St. John's Wood Park, N.W.	*
	St. Olave's and St. John's Institute, Tooley St., S.E.	V. A. Jaynes, M.R.C.S., .. 157, Jamaica Road, Bermondsey, S.E.	Wednesday; 3 (except August and September.)
	Royal Free Hospital, Gray's Inn Road, W.C.	Mrs. F. E. Willey, M.D., 1a, Devonshire Street, W.	*
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Liverpool ..	17, Mulgrave Street	*Dr. N. E. Roberts*, .. 17, Mulgrave Street	*
Manchester ..	St. Mary's Hosp., Whitworth Street West	John Scott, M.D., .. 249, Upper Brook Street	*
Newcastle ..	The Dispensary, Nelson St.	*F. Hawthorn, M.D.*, .. 6, Regent Terrace	*
Sheffield ..	Jessop Hospital for Women	Dr. P. E. Barber. .. .. 3, Clarkehouse Road	*
Cardiff ..	University College	Dr. F. E. Roberts, University College, Old Buildings.	*
Aberdeen ..	The Public Dispensary ..	Dr. T. Fraser, ... 51, Elmbank Terrace	Wednesday ; 2.30 (during med. sess.)
Dundee ..	Royal Infirmary	R. C. Buist, M.D., ... 166, Nethergate	Monday ; 2 (during medical session).
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	Livingstone Dispensary, 39, Cowgate		Tuesday ; 3 (during med. sess.)
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Dublin ..	45, Upper Sackville Street ..	*Dr. A. N. Montgomery*, .. 45, Upper Sackville Street	Tuesday, Friday ; 10 (during med. sess.)
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*(a.) Candidates for Certificates should communicate with the authorized Teacher to learn the dates of his or her regular courses of instruction. * Days and hours arranged each Session.*

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Abernethian Society—St. Bartholomew's Hospital, E.C.
Æsculapian Society—Secretary, 346, Kingsland Road, N.E.
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Association of Medical Officers of Health—Sec., D. A. Belilios, M.R.C.S., L.R.C.P., 109, Queen's Road, Wimbledon.
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British Dental Association—Secretary, 19, Hanover Square, W.
British Homœopathic Society—Secretary, Great Ormond Street, W.C.
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British Medical Benevolent Fund—Sec., St. Bartholomew's Hospital, E.C.
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Chemical Society—Burlington House, Piccadilly, W.
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Geological Society of London—Burlington House, Piccadilly, W.
Harveian Society of London—Stafford Rooms, Tichborne Street, W.
Hospital Saturday Fund—Sec., 54, Gray's Inn Road, W.C.
Hunterian Society, The London Institution—Finsbury Circus, E.C.
Imperial Cancer Research Fund—Examination Hall, Victoria Embankment.
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Incorporated Institute of Hygiene—Sec., 34, Devonshire Street, W.
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King's College Medical Society—King's College Hospital, W.C.
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Lister Institute of Preventive Medicine—Chelsea Bridge Road, S.W.
Liverpool School of Tropical Medicine—B10, Exchange Buildings, Liverpool.
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British Medical Journal—Weekly 6d.—429, Strand, W.C.
British Sanatoria Annual—5/- yearly—Bale, 83-91, Great Titchfield St., W.
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Medical Magazine—Monthly 1/-—44, Bedford Row, W.C.
Medical Officer—Weekly 4d.; 15/- per annum—36-38, Whitefriars Street, E.C.
Medical Press and Circular—Weekly 5d.; 21/– per annum—Baillière, 8, Henrietta Street, W.C.
Medical Register—Annually 10/6—5, New Street Square, E.C.
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Neurology and Psychiatry, Review of—25/- per annum—20, South Frederick Street, Edinburgh.
New York Medical Journal—Weekly 6d.—66, West Broadway, New York.

New York Medical Record—Weekly 6d.—Wm. Wood & Co., 51, Fifth Avenue, New York
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Nursing Times—Weekly, 1d.—Macmillan & Co., St. Martin's Street, W.C.
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Ophthalmic Hospital Reports, The Royal London—At intervals 5/-—J. & A. Churchill, 7, Great Marlborough Street, W.
Ophthalmic Review—Monthly 1/-—33, Soho Square, W.
Ophthalmological Society's Transactions—Yearly 12/6—J. & A. Churchill, 7, Great Marlborough Street, W.
Ophthalmoscope—Monthly 2/-—Pulman & Sons Lim., 24, Thayer Street, W.
Pathology and Bacteriology, Journal of—Quarterly, 21/- per annum—Pathological Laboratory, The Museums, Cambridge.
Pediatrics, Archives of—Monthly, 14/6 per annum—E. B. Treat & Co., New York.
Pharmaceutical Journal—Weekly 6d.—72, Great Russell Street, W.C.
Pharmacy, Year Book of—Annually 10/-—7, Great Marlborough Street, W.
Phonographic Record of Clinical Teaching and Medical Science—Bi-monthly 1/-—Pulman & Sons Lim., 24, Thayer Street, W.
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Public Health Service Directory—Annually 10/6—36-38, Whitefriars St., E.C.
Quarterly Journal of Medicine—Quarterly, 8/6—Oxford University Press, Amen Corner, E.C.
R.A.M.C., Journal of the—Monthly 2/-—Bale, 83–91, Great Titchfield St., W.
Röntgen Ray, Archives of the—Monthly 1/8; 16/- per annum—Rebman Lim., 129, Shaftesbury Avenue, W.C
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Royal Anthropological Institute, Journal of the—Half-yearly 15/-—50, Great Russell Street, W.C.
Royal Dental Hospital Gazette—Quarterly 1/-—83–91, Great Titchfield St.,W.
Royal Microscopical Society, Journal of the—Bi-Monthly 6/-—5, Queen Victoria Street, E.C.
Royal Sanitary Institute, Journal of the—14/-per ann.—12-14,Long Acre,W.C.
Royal Society of Medicine, Proceedings of the—Monthly 7/6, November to July—Longmans, Green & Co., 39, Paternoster Row, E.C.
Sanitary Record—Weekly 3d.; 14/- per annum—5, Fetter Lane, E.C.
School Hygiene—Monthly 6d.—2, Charlotte Street, W.
South African Medical Record—Fortnightly, 1/-; 21/- per annum—Baillière, 8, Henrietta Street, W.C.
St. Bartholomew's Hospital Journal—Monthly 6d.—St. Bartholomew's Hospital, E.C.
St. George's Hospital Gazette—Monthly 6d.—83-91, Great Titchfield St., W.
St. Mary's Hospital Gazette—Monthly, 5/- per annum—187, Edgware Rd., W.
St. Thomas's Hospital Reports—Yearly 8/6—7, Great Marlborough Street, W.
Surgery, Gynæcology, and Obstetrics—Monthly, 2/6; 25/- per annum—Baillière, 8, Henrietta Street, W.C.

Therapist, The—Monthly 6d.; 5/- per annum—Henderson & Spalding, Sylvan Grove, Old Kent Road, S.E.
Tropical Life—Monthly 1/-—83–91, Great Titchfield Street, W.
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Tuberculosis, British Journal of—Quarterly 1/6—Baillière, 8, Henrietta Street, W.C.
Vaccine Therapy, Journal of—Monthly 1/-; 10/6 per annum—H. K. Lewis, 136, Gower Street, W.C.
Veterinary Journal—Monthly 1/-—Baillière, 8 Henrietta Street, W.C.
Veterinary News—Weekly 2d.—Baillière, 8, Henrietta Street, W.C.
West London Medical Journal—Quarterly 1/-—23, Bartholomew Close, E.C.
Zoologist—Monthly 1/-—54, Hatton Garden, E.C.

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Macfarlan, J. F. & Co., Edinburgh, and 9 & 11, Moor Lane, E.C.
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Meister, Lucius & Brüning Lim., 3, Jewry Street, E.C.
Menley & James Lim., Menley House, Farringdon Road, E.C.
Merck, E., 16, Jewry Street, E.C.
Newbery, F. & Sons Lim., Charterhouse Square, E.C.
Oppenheimer, Son & Co., Lim., 179, Queen Victoria Street, E.C.
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Phillips (Chas. H.) Chemical Co., 14, Henrietta Street, W.C.
Quibell Bros. Lim., Newark.
Raimes & Co., York
Reynolds & Branson Lim., 13, Briggate, Leeds
Richards, J. M. & Sons Lim., 46, Holborn Viaduct, E.C.
Riedel, The J. D., Co., 54, Cannon Street, E.C.
Roberts & Co., 76, New Bond Street, W.
Rogers, F. A., 327, Oxford Street, W.
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Savory & Moore Lim., 143, New Bond Street, W.
Southall Bros. & Barclay Lim., Birmingham
Squire & Sons, 413, Oxford Street, W.
Sumner, R. & Co. Lim., 50A, Lord Street, Liverpool
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Widenmann, Broicher & Co., 33, Lime Street, E.C.
Wilcox, Jozeau & Co, 49, Haymarket, S.W.
Willows, Francis, Butler & Thompson Lim., 40, Aldersgate Street, E.C.
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Wright, Layman & Umney Lim., 48, Southwark Street, S.E.
Wulfing, A. & Co., 12, Chenies Street, W.C.
Wyleys Lim., Coventry
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Zimmermann, Chas. & Co., 9 & 10, St. Mary-at-Hill, E.C.

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Cox, Harry W. & Co. Lim., 47, Gray's Inn Road, W.C.
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Leitz, E., Oxford House, 9, Oxford Street, W. (Microscopes).
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Davidson, F. & Co., 29, Great Portland Street, W.
Newton & Wright Lim., 72, Wigmore Street, W.
Ross Lim., 111, New Bond Street, W.
Watson, W. & Sons Lim., 313, High Holborn, W.C.
Yates, C. & Co., 4, Regent Parade, Birmingham

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Cassell & Co., Lim. Ludgate Hill, E.C.
Wright, John & Sons Lim., Bristol

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Adlard & Son, Bartholomew Close, E.C.
Appleton, D. & Co., 25, Bedford Street, Covent Garden, W.C.
Arnold, Edward, 41 & 43, Maddox Street, W.
Baillière, Tindall & Cox, 8, Henrietta Street, W.C.
Bale, John Sons & Danielsson Lim., 83-91, Great Titchfield St., W.
Cambridge University Press (C. F. Clay), Fetter Lane, E.C.
Cassell & Co., Lim. La Belle Sauvage, Ludgate Hill, E.C. (and Printers).
Churchill, J. & A., 7, Great Marlborough Street, W.
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Davis, F. A. Co. (Stanley Phillips, 23, Creighton Road, Queen's Park, N.W.)
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Glaisher, H. J., 57, Wigmore St., W.
Green, Wm. & Sons, St. Giles Street, Edinburgh
Griffin, Chas. & Co. Lim., 12, Exeter Street, Strand, W.C.
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Allen & Hanburys Lim., 48, Wigmore Street, W., and Lombard St., E.C.
Arnold & Sons, 42, Beaumont Street, W., and Giltspur Street, E.C.
Bailey, W. H. & Son, 38, Oxford Street, W.
Barth, Geo. & Co., 54, Poland Street, Oxford Street, W. (Inhalers).
Billmeier, J., 6, William Street, Manchester Square, W.
Bridge, G. E. & Co. Lim., 128, Old Christchurch Rd., Bournemouth
Clarke, John & Co. (Successors) Lim., 8, Donegall Square West, Belfast
Coles, William & Co., 5, Sackville St., Piccadilly, W. (Trusses)
Cox, Alfred & Sons, 120, New Bond Street, W.
Domen Belts Co. Lim., 456, Strand, W.C. (Belts, Trusses, etc)
Down Bros. Lim., 21 & 23, St. Thomas's Street, S.E.
Ernst, F. Gustav, 80 & 82, Charlotte Street, Fitzroy Square, W.
Fannin & Co. Lim., Grafton Street, Dublin
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Hawksley & Son, 357, Oxford St., W.
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Holborn Surgical Instrument Co. Lim., 26, Thavies Inn, E.C.
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Holland & Son, 46, South Audley Street, W. (Foot Supports)
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Huxley, E. & Son, 13, Old Cavendish Street, W.
Krohne & Sesemann, 37, Duke Street, W.
Maw, S., Son & Sons, 7 to 12, Aldersgate Street, E.C.
Mayer & Meltzer, 71, Great Portland Street, W.
Medical Supply Association, 228–230, Gray's Inn Road, W.C.
Montague, J. H., 69, New Bond Street, W.
Mottershead & Co., 7, Exchange St., Manchester
Reynolds & Branson Lim., 13, Briggate, Leeds
Rogers, F. A., 327, Oxford Street, W.
Salmon, Ody & Co., 164, Strand, W.C. (Belts, Trusses, etc)
Salt & Son Lim., 7, Cherry Street, Birmingham
Statham, H. & Co., Corporation St., Manchester (Bandages, etc.)
Sumner, R. & Co. Lim., Lord Street, Liverpool
Weiss, John & Son Lim., 287, Oxford Street, W.
Woolley, Jas. Sons & Co. Lim., Victoria Bridge, Manchester
Young, Archibald & Son, 57–61, Forrest Road, Edinburgh

Syringes, for Hot Injections.

The "Leedro" Co., 6, Summerhill Avenue, Newport, Mon.

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Zeal, G. H., 82, Turnmill Street, E.C.

Vaccine Lymph.

Government Lymph Establishment, Colindale Avenue, The Hyde, N.W. Lymph is supplied, to Public Vaccinators, free of charge, on application to the Clerk
Arents, E. (Dr. Doucet's), 48, Surrey Square, Old Kent Road, S.E.
Association for the Supply of pure Vaccine Lymph, Kingston, Surrey
Ferris & Co. Lim., Bristol
Jenner Institute for Calf Lymph, 73, Church Road, Battersea, S.W.
Renner's (Dr.) Establishment, 75, Upper Gloucester Place, N.W.
Roberts & Co. (Dr. Chaumier's), 76, New Bond Street, W.

NOTE BOOK.

It is easier to make a note of a thing than to remember *where* the note was made. The following pages are indexed under their respective headings, and any note can be immediately found when required.

NOTES.

Copy here any formula or fact you wish to keep for reference. (These pages are indexed under the word "Notes.")

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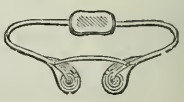

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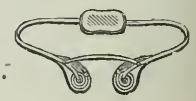

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INDEX TO LIFE ASSURANCE OFFICES

A, *when Established;* B, C, D, *Annual Premiums to Insure £100 on death, with Profits, at the age of 30, 40, and 50;* E, *Assurance and Annuity Funds, exclusive of Paid-up Capital.*
M, *Mutual Offices;* P, *Proprietary Offices.*

Those marked with an asterisk (*) in the E column have not sent revised figures for 1911.

Title, Etc., of Office.	A	B	C	D	E
					£
Abstainers and General, Life, Fire, etc., Edmund St., Birmingham. *Act. & Sec.*, R. A. Craig A.I.A. .. .. P	1883	40/11	55/10	82/3	572,785
Alliance, Fire, Life, Marine, Accident, and Annuities, Bartholomew Lane, E.C. *Gen. Man.*, Robert Lewis .. P	1824	48/9	64/5	90/9	*6,126,033
Atlas, Fire, Life, and Accident, 92, Cheapside, E.C. *Act.*, Robert Cross. *Gen. Man.*, Saml. J. Pipkin .. .. .. P	1808	49/3	63/7	88/8	2,085,791
Australian Mutual Provident Society, Life, Endowments & Annuities, 37, Threadneedle St., E.C. *Res. Sec.*, A. C. Hollingworth. Further particulars see page 737 M	1849	48/2	64/5	89/10	27,078,811
Britannic Assurance Co., Ltd., Life Endowments & House Purchase, Broad Street Corner, Birmingham. *Chairman*, F. T. Jefferson, J.P. *Sec.*, J. A. Jefferson, F.I.A. Further particulars see page 736 P	1866	48/6	65/2	94/-	2,700,000
British Equitable, Life, Fire, Accident, Burglary, Employers' Liability 1, 2, 3, Queen St. Place, E.C. *Man.*, Basil May, F.I.A. P	1834	48/8	64/11	91/9	1,709,786
Caledonian, Fire, Life, Personal Accident and All Illness, Employers' Liability, Burglary, 19, George Street, Edinburgh. *Gen. Man.*, Robert Chapman. London Offices, 82, King William Street, E.C., and 14, Waterloo Place, S.W. .. P	1805	48/9	64/6	88/6	2,893,137
City of Glasgow, Life, 30, Renfield Street, Glasgow. *Gen. Man.*, William S. Nicol. London Office, 12, King William St., E.C. *London Man.*, L. Campbell .. P	1838	48/9	64/6	84/10	3,119,328
City Life, 6, Paul Street, Finsbury, E.C. *Man. Director*, M. Gregory ..	1817	44/1	60/11	89/7	463,385
Clergy Mutual, Life, 2 & 3, Sanctuary, Westminster. *Act. & Man.*, F. B. Wyatt. *Sec.*, W. N. Neale. Further particulars see page 735 .. .. M	1829	46/4	62/2	87/4	4,662,049
Clerical, Medical and General, Life, 15, St. James's Square, and 1, King William Street, E.C. *Act. & Sec.*, A. D. Besant P	1824	48/7	66/9	96/3	5,468,071
Colonial Mutual, Life, Personal Sickness and Accident, and Annuity, 33, Poultry. *Man.*, Arthur E. Gibbs .. .. M	1873	47/4	63/2	89/9	3,211,446
Commercial Union, Fire, Life, Marine and Accident, 24, 25, and 26, Cornhill, E.C. *Act.*, H. C. Thiselton .. .. P	1861	47/10	65/2	92/4	4,349,572
Co-operative, Life, Accident, Fidelity, and Fire, Corporation Street, Manchester. *Sec.*, James Odgers. Further particulars see page 738 .. .. .. P	1867	47/4	63/1	90/1	203,696
Eagle, Life, 79, Pall Mall, S.W. *Gen. Man.* Geo. R. Jellicoe; *Sec.*, J. F. E. Hall P	1807	48/7	64/5	89/10	2,179,300
Edinburgh, Life, Endowments, and Annuities, 26, George Street, Edinburgh. *Man.* T. M. Gardiner. *Sec. & Act.*, A. E. Sprague, D.Sc., F.F.A., F.I.A. London, 3, Birchin Lane, E.C. *Sec.*, J. J. Bisgood .. P	1823	47/11	64/2	90/2	4,329,094
English and Scottish Law, Life, Annuity, Endowment, and Loan, 33, St. James's Square, S.W. *Gen. Man.*, Albert G. Scott. *Act. & Sec.*, John Spencer, F.I.A. P	1839	47/1	62/8	87/9	2,986,239

A, *when Established;* B, C, D, *Annual Premiums to Insure £100 on death, with Profits, at the age of 30, 40, and 50;* E, *Assurance and Annuity Funds, exclusive of Paid-up Capital.* M, *Mutual Offices;* P, *Proprietary Offices.*

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Title, Etc., of Office.	A	B	C	D	E
					£
Equitable Life Assurance Society, Mansion House St., E.C. *Act.& Sec.*, G. J. Lidstone M	1762	53/5	67/11	90/7	5,241,949
Equity and Law, Life, 18, Lincoln's Inn Fields, W.C. *Act. & Sec*, W. P. Phelps, M.A., F.I.A... .. .. P	1844	48/10	64/6	90/9	*4,641,253
Friends' Provident, Life, Annuities, etc., Bradford, Yorkshire. *Sec.*, William H. Gregory. *Act.*, Alfd. Moorhouse, F.I.A. M	1832	48/–	64/–	89/7	3.429,547
General Accident, Fire and Life, Perth, Scotland. *Gen. Man.*, F. Norie-Miller, J.P. P	1885	49/2	64/11	91/3	65,602
General, Life. 103, Cannon Street, E.C. *Man. & Sec.*, John Robert Freeman. Further particulars see page 736 P	1837	49/10	65/4	92/8	1,995,612
Gresham, Life, St. Mildred's House, E.C. *Gen. Man.*, James H. Scott .. P	1848	48/2	64/1	91/5	10,216,844
Guardian, Fire, Life, Accident, Burglary, Fidelity Guarantee, and Plate Glass, 11, Lombard Street, E.C., & 21, Fleet St. *Sec.*, T. G. C. Browne. *Act.*, Ernest Woods P	1821	48/10	64/6	89/3	4,119,890
Law Union and Rock, Life, Fire, Accident, Annuities, Burglary, etc., 126, Chancery Lane. *Gen. Man.*, Alex. Mackay P	1806	48/4	64/–	89/10	7,611,358
Legal and General, Life, and Annuities, 10, Fleet Street, E.C. *Act. & Man.*, E. Colquhoun .. .. .. P	1836	50/9	65/11	90/9	*5,903,633
Life Association of Scotland, 82, Princes St., Edinburgh. *Man.*, Gordon Douglas. *Sec.* R. M. M. Roddick. London Office, 28, Bishopsgate, E.C. *Sec.*, J. C. Wardrop P	1838	48/11	64/10	91/1	5,912,207
Liverpool and London and Globe, Fire, Life, Annuities, Accident, etc., 1, Dale St., Liverpool. *Gen. Man. & Sec.*, A. G. Dent. London Office, 1, Cornhill, E.C. P	1836	49/10	65/9	91/3	5,109,210
London and Lancashire, Life and General, 66 & 67, Cornhill, E.C. *Gen. Man. & Sec.*, W. Æneas Mackay. *Jnt. Asst. Secs.*, E. E. Dent and L. C. Kestin. *Act.*, Harold Dougharty, A.I.A., F.C.I.S. .. P	1862	46/10	62/4	86/10	*2 500,388
London Assurance Corporation, Fire, Life, Marine, and Accident, 7, Royal Exchange. *Man.* of Life Dept., James Clunes. *Act.*, A. G. Hemming .. .. P	1720	49/–	64/8	90/2	2,494,655
London Life Association, Lim., 81, King William Street, E.C. *Act. & Man.*, H. M. Trouncer, M.A, F.I.A. .. M	1806	60/–	79/–	108/–	5,183,213
Marine and General Mutual, Life, and Marine, 14, Leadenhall Street, E.C. *Act. & Sec.*, S. Day, F.I.A. .. .. M	1852	48/10	65/–	91/6	1,766,166
Metropolitan Life, 13, Moorgate St., E.C. *Sec.*, Bernard Woods. *Act.*, H. J. Baker M	1835	49/9	66/4	92/–	2,254,005
Mutual Life and Citizens', 17, Coleman Street, E.C. *Man.*, Jas. Graham, F.I.A., F.F.A. P	1886	48/9	65/3	89/9	7 094,810
Mutual Life Insurance Co. of New York, 16, 17 and 18, Cornhill, E.C. *Gen. Man.*, J. H. Harrison Hogge. *Sec.*, T. Crawford M	1843	48/9	66/–	97/–	116,094,186
National Mutual Life, 39, King Street, Cheapside, E.C. *Act. & Man.*, Geoffrey Marks, F.I.A. *Sec.*, H. J. Lockwood. *Asst. Act.*, C. R. V. Coutts, F.I.A. M	1830	48/4	63/7	89/6	2,943,534
National Mutual Life Association of Australasia, Ltd., 5, Cheapside, E.C. *Man.*, John B. Gillison, F.I.A., F.F.A. Further particulars see page 738 M	1869	46/8	61/6	87/2	6,500,000
National Provident, 48, Gracechurch Street, E.C. *Act. & Sec.*, L. F. Hovil M	1835	50/2	66/3	91/1	6,920,500
New York Life, Trafalgar Buildings, Trafalgar Square, London, W.C. *Sec.*, Wm. R. Collinson, F.C.I.S. .. .. M	1845	48/9	66/–	96/11	131,075,016

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Those marked with an asterisk (*) in the E column have not sent revised figures for 1911.

Title, Etc., of Office.	A	B	C	D	E
					£
North British and Mercantile, Fire, Life, Annuities, 61, Threadneedle St., E.C., and 64, Princes St., Edinburgh. *Life Man. & Act.*, London, H. Cockburn. *Home Fire & Jt. Life Man.*, D. C. Haldeman. *Sec.*, R. Carmichael. West End Office, 7, Waterloo Place, S.W. *Man.*, D. C. Haworth-Booth. Further particulars see page cviii P	1809	49/10	66/1	91/11	15,643,125
Northern Assurance, 1, Moorgate St., E.C. *Gen. Man.*, H. E. Wilson .. P	1836	49/-	64/8	90/10	5,040,555
Norwich Union, Life, Norwich. *Gen. Man. & Act.*, Davidson Walker. London Office, 50, Fleet Street, E.C.	1808	45/8	59/6	85/3	10,711,981
Pearl, Life, London Bridge, City, E.C. *Jnt. Man'g Directors*, F. D. Bowles, Esq., J.P., C.C., G. Shrubsall, J.P. .. P	1864	49/-	65/-	92/-	6,356,099
Phœnix Assurance, 19 & 70, Lombard St., 57, Charing Cross, and 187, Fleet Street, E.C. *Gen. Man.*, Sir Gerald H. Ryan, F.I.A. P	1782	48/11	64/7	90/8	10,360,677
Provident Clerks & General Mutual Life Assurance Association, 27 & 29, Moorgate St., E.C. *Sec.*, John E. Gwyer M	1840	46/4	62/8	92/2	2,679,416
Prudential (Ordinary), Life, Holborn Bars. *Jnt. Secs.*, D. W. Stable and J. Smart. Further particulars see page 737 P	1848	49/6	65/11	91/11	42,200,962
Refuge, Life, Oxford St., Manchester. *Joint Mans.*, R. Wm. Green & Philip Smith. London Office, 133, Strand, W.C. P	1864	49/3	65/9	91/9	7,272,228
Royal Exchange Assurance, Fire, Life, Annuities, etc., Royal Exchange, and 44, Pall Mall. *Act.*, H. E. Nightingale, F.I.A. P	1720	49/-	64/9	90/2	3,987,503
Royal, Fire, Life, Annuities, and Accident, Royal Insurance Buildings, Liverpool. *Man.*, G. Chappell. London Offices, 24–28, Lombard Street. *Sec.*, R. M'Connell P	1845	48/8	64/4	90/4	10,306,847
Sceptre, Life and Endowments, 40, Finsbury Pavement, E.C. *Sec.*, W. E. Wright P	1864	48/8	64/8	90/6	*1,155,373
Scottish Amicable, Life, St. Vincent Place, Glasgow. *Man.*, W. Hutton. *Sec.*, C. Guthrie .. .. M	1826	51/9	66/3	90/1	5,540,845
Scottish Equitable, Life, 28, St. Andrew Square, Edinburgh. *Man. & Act.*, G. M. Low. *Sec.*, J. J. McLauchlan. London Office, 17, Cornhill, E.C. *Sec.*, P. W. Purves. M	1831	50/-	65/5	90/6	5,877,835
Scottish Life, Life, Accident and Annuities, 19, St. Andrew Square, Edinburgh. *Man.*, Sir David Paulin, F.R.S.E. London Office, 13, Clements Lane, E.C. *Sec.*, George Struthers .. .. .. P	1881	49/5	64/6	90/5	1,616,122
Scottish Metropolitan, Life, Accident and Annuities, 25, St. Andrew Square, Edinburgh. *Man.*, H. E. Marriott. London Office, 8, King Street, E.C. *Man.*, C. E. M. Hudson .. .. P	1876	40/8	54/7	79/7	813,344
Scottish Provident, Life & Annuities, 6, St. Andrew Square, Edinburgh. *Man.*, J. G. Watson. *Joint Secs.*, J. Lamb and R. T. Boothby. *Asst. Sec.*, C. W. Thomson. *Act.*, W. G. Walton. London Offices, 3, Lombard Street, E.C., and 17, Pall Mall, S.W. M	1837	42/4	56/6	83/2	14,760,000
Scottish Temperance, Life, Sickness & Accident, 105, St. Vincent Street, Glasgow. *Manager*, Adam K. Rodger. London, 2, 3 & 4, Cheapside. *Man.*, W. A. Bowie. *Less 10 per cent to Whole Life Abstainers* P	1883	48/6	63/9	89/10	1,680,609
Scottish Union & National, Fire, Life, Accident, Pensions, Annuities, etc., 35, St. Andrew Sq., Edinburgh. *Gen. Man.*, J. A. Cook. London Office, 5, Walbrook, E.C. *Sec.*, James G. Nicoll .. P	1824	50/6	65/6	91/-	4,859,394

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Those marked with an asterisk (*) in the E column have not sent revised figures for 1911.

Title, Etc., of Office.	A	B	C	D	E
					£
Scottish Widows' Fund, Life & Survivorship, 9, St. Andrew Square, Edinburgh. *Man. & Act.*, N. B. Gunn. *Sec.*, J. G. C. Cheyne. London Offices, 28, Cornhill, E.C., and 5, Waterloo Place, S.W. *Sec.*, R. Machire. Further particulars see page lxiv .. .. .. M	1815	51/9	66/3	90/7	20,240,396
Standard Life, 3, George Street, Edinburgh. *Man.*, Leonard W. Dickson. London Offices, 83, King William St., and 3, Pall Mall East. *Sec.*, J. H. W. Rolland P	1825	48/11	64/5	89/-	12,658,288
Star, Life, Annuities, Endowments, etc., 32, Moorgate Street, E.C. *Gen. Man.*, J. Douglas Watson. .. .. P	1843	49/9	66/3	93/8	6,752,602
Sun, Life, 63, Threadneedle Street, E.C. *Act.*, R. G. Salmon, F.I.A. *Sec. & Gen. Man.*, E. Linnell .. .. P	1810	49/2	66/6	94/2	8,601,667
Sun Life of Canada, Life and Annuities, Canada House, 4 & 5, Norfolk Street, W.C. *Man.*, J. F. Junkin .. .. P	1865	48/6	65/2	94/1	7,497,836
United Kingdom Temp., etc., Life, 196, Strand, W.C. *Sec.*, H. W. Hasler M	1840	48/10	64/11	90/6	9,400,000
University, Life, 25, Pall Mall, S.W. *Act. & Sec.*, R. Todhunter, M.A P	1825	49/11	65/4	91/5	895,400
Wesleyan and General, Life, Annuities, Sickness, Assurance Buildings, Steelhouse Lane, Birmingham. *Gen. Man. & Act.*, R. A. Hunt. London Office, 101, Finsbury Pavement, E.C. Further particulars see page 736 .. .. M	1841	48/1	65/8	93/10	1,618,029
Yorkshire Limited, St. Helen's Square, York. London Office, 2, Bank Buildings, Princes Street. Further particulars see page 730 P	1824	49/1	64/9	91/7	1,996,331

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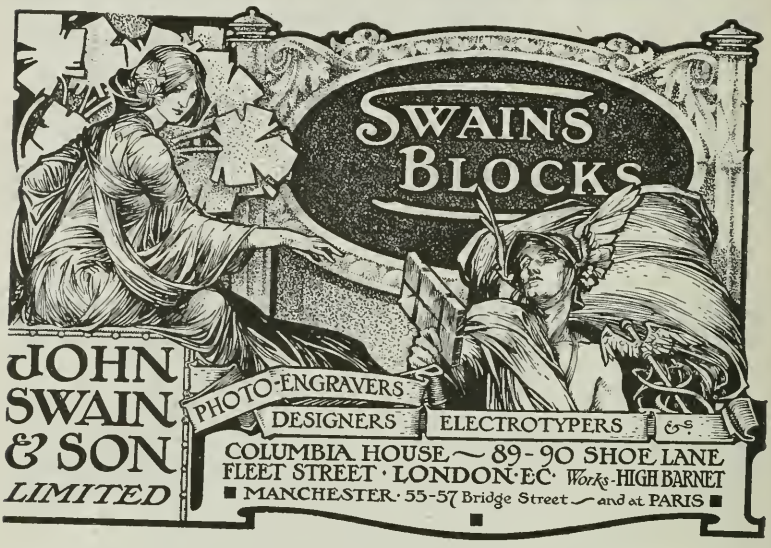

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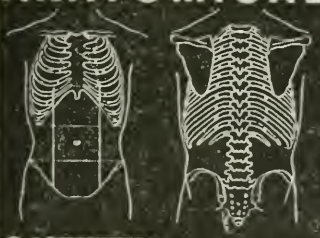

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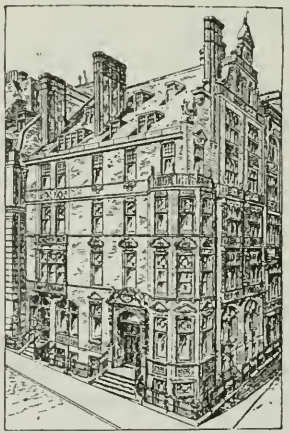

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THE

MIDDLESEX HOSPITAL MEDICAL SCHOOL.

A School of the University of London.

THE Hospital and Medical School are fully equipped for teaching the entire medical curriculum, including instruction in Maternity Wards, which have recently been added to the Hospital.

HOSPITAL APPOINTMENTS.

The following appointments, besides the usual Clerkships and Dresserships, are open to all General Students without extra fee :—

House Physicians	6	appointments annually for 6 months.
House Surgeons	6	,, ,, ,,
Obstetric House Physicians ...	2	,, ,, ,,

The Medical, Surgical, and Obstetric Registrars are appointed by the Weekly Board, on the recommendation of the Medical Committee, as vacancies arise (salary **£40** a year each).

The Medical and Surgical Casualty Officers are appointed in the same manner (salary **£50** a year each, with board and residence).

SCHOLARSHIPS AND PRIZES.

THREE ENTRANCE SCHOLARSHIPS, of the value of **£100, £50,** and **£25** respectively, and a UNIVERSITY SCHOLARSHIP in Anatomy and Physiology, value of **£50,** open to Students of Oxford and Cambridge Universities who have already passed or completed the curriculum for the professional examinations in Anatomy and Physiology, are offered for competition at the commencement of the Winter Session.

TWO BRODERIP SCHOLARSHIPS, of the value of **£60** and **£40** respectively, are awarded every year for proficiency in Clinical Knowledge.

THE MURRAY GOLD MEDAL AND SCHOLARSHIP (**£25**), founded in connection with the University of Aberdeen, is awarded every third year to a Student of The Middlesex Hospital.

The following are awarded annually :—

The Hetley Prize, value **£25** (Clinical Medicine, Surgery and Obstetrics).
The Lyell Medal and Scholarship, value **£55** (Surgical Anatomy and Practical Surgery).
The Leopold Hudson Prize, value **11** guineas (Surgical Pathology and Bacteriology).
The Freeman Scholarship, value **£30** (Obstetric Medicine and Gynæcology).
Second Year's Exhibition, value **£10 10s.** (Anatomy and Physiology).
"Emden" Cancer Research Scholarship, **£100.**
"Richard Hollins" Research Scholarship, **£105.**
Salters' Company Cancer Research Scholarship, **£100.**
Cancer Research Scholarship, **£60.**
New Zealand Students' Scholarship, the Clinical advantages of the Hospital for 1 year Free.

The Tutors assist all Students, especially those who are preparing for Examinations, without extra fee; thus the necessity of obtaining private instruction is obviated.

The Amalgamated Clubs' Athletic Ground is within easy reach of the Hospital.

Full particulars may be obtained on application to—

H. CAMPBELL THOMSON, M.D., F.R.C.P., Dean of the Medical School,
Middlesex Hospital, LONDON, W.

St. MARY'S HOSPITAL MEDICAL SCHOOL

(UNIVERSITY OF LONDON).

SESSIONS 1912.

Students may conveniently commence work on any of the following dates:—

Thurs. JAN. 4th, 1912; Tues. APRIL 23rd, 1912; Tues. OCT. 1st, 1912

THE MEDICAL SCHOOL is situated in the Paddington District of the West End of London, and being in close proximity to five Railway Stations, is easy of access from all parts of the Metropolis and Suburbs. An official register of Students' rooms in the neighbourhood, and of private families who receive students as boarders, is kept in the office of the Medical School. The new Athletic Clubs' Ground, recently acquired at Park Royal, Acton, is now in use, and is easily accessible from the Medical School.

COURSES OF STUDY.

Instruction is provided in all subjects of the curriculum, under Recognised Teachers of the University of London, as follows:—

(*a*) **Preliminary Scientific.**—Complete Courses in Chemistry, Physics, and Biology. Students can join in January, April or October.

(*b*) **Intermediate.**—Systematic Courses of Anatomy, Physiology, and Pharmacology, with Special Tutorial Classes for the 2nd M.B. London and Primary F.R.C.S.

(*c*) **Final.**—Systematic Lectures, Clinical Instruction, and Tutorial Classes in Medicine, Surgery, Obstetrics, and the various Special Departments. Full Laboratory Courses in General and Special Pathology; also in Bacteriology and Chemical Pathology with especial Reference to their clinical application.

CLINICAL PATHOLOGY AND OPSONIN DEPARTMENT.

Advanced Courses of Clinical Pathology and Bacteriology, under the direction of Sir Almroth Wright, F.R.S., are held throughout the year, and practical experience in Opsonic Investigation may be obtained in the Department of Therapeutic Inoculation.

RESIDENT MEDICAL OFFICERS.

Twenty are appointed Annually by Competitive Examination.

Five Entrance Scholarships in Natural Science, value from £100 to £25, are awarded annually by Examination in September.

HOSPITAL STAFF.

Consulting Physician—Dr. LEES.
Consulting Surgeons—Mr. A. T. NORTON, C.B., Mr. EDMUND OWEN, Mr. H. W. PAGE, Mr. A. J. PEPPER; (Aural) Mr. G. P. FIELD; (Ophthalmic) Sir G. A. CRITCHETT, Mr. H. E. JULER; (Skin) Sir MALCOLM MORRIS; (Dental) Mr. MORTON SMALE; (Throat) Dr. SCANES-SPICER. Consulting Anæsthetist: Mr. HENRY DAVIS.
Physicians—Dr. S. PHILLIPS, Dr. A. P. LUFF, Dr. WILFRED HARRIS, (Out-patients) Sir JOHN BROADBENT, Dr. W. H. WILCOX, Dr. R. H. MILLER.
Surgeons—Mr. J. E. LANE, Mr. V. W. LOW; Mr. W. H. CLAYTON-GREENE; (Out-patients) Mr. MAYNARD SMITH, Mr. FITZWILLIAMS, Mr. V. Z. COPE.
Obstetric Surgeons—Dr. M. HANDFIELD JONES; (Out-patients) Dr. W. J. GOW.
Ophthalmic Surgeon—Mr. LESLIE PATON. *Assistant Ophthalmic Surgeon*—Mr. G. COATS.
Surgeons to Ear, Nose and Throat Department—Dr. WM. HILL, Mr. C. I. GRAHAM.
Physician in charge of Skin Department—Dr. GRAHAM LITTLE.
Dental Surgeon—Mr. W. H. DOLAMORE.
Director of Inoculation Department—Sir ALMROTH WRIGHT, F.R.S.

LECTURERS.

Clinical Medicine—Dr. PHILLIPS
Clinical Surgery—Mr. LANE
Medicine—Dr. LUFF, Dr. HARRIS, Sir JOHN BROADBENT
Surgery—Mr. LOW, Mr. CLAYTON-GREENE
Practical Surgery—Mr. MAYNARD SMITH, Mr. FITZWILLIAMS
Pathology—Sir ALMROTH WRIGHT, F.R.S. Dr. SPILSBURY.
Bacteriology—Capt. DOUGLAS, I.M.S. Dr. FREEMAN (Assist. Lecturer)
Pathological Chemistry—Dr. W. H. WILCOX
Midwifery—Dr. GOW
Pharmacology—Dr. R. H. MILLER
Forensic Medicine—Dr. WILCOX
Hygiene—Dr. WILCOX
Mental Diseases—Dr. COLE
Neurology—Dr. HARRIS
Anatomy—Mr. J. ERNEST FRAZER
Physiology and Histology—Dr. H. E. ROAF
Biology—Dr. RIDEWOOD
Chemistry—Dr. G. SENTER
Physics—Mr. W. H. WHITE

For Calendar of the Medical School, giving full information as to Courses of Study, Fees, etc., apply to the Dean, Sir JOHN BROADBENT, or to Mr. B. E. MATTHEWS, School Sec.

LONDON SCHOOL OF DERMATOLOGY.

Conducted by the Medical Staff of ST. JOHN'S HOSPITAL FOR DISEASES OF THE SKIN, Leicester Square, W.C.

Those desirous of acquiring a practical knowledge of the Histo-Pathology and Bacteriology of the Skin and of General Bacteriology, can make arrangements for instruction, either alone or in class, by applying by letter to the Secretary of the School at the above address.

Advanced Courses and Research work can be arranged for. Those studying in the Laboratory have the privilege of attending the practice of the Hospital. Microscopes are provided, and students may take away the specimens mounted.

GEO. A. ARNAUDIN, *Secretary.*

ST. JOHN'S HOSPITAL FOR DISEASES OF THE SKIN.

(INCORPORATED),

Out-Patient Department - - - - 49, LEICESTER SQUARE, W.C.
In-Patient Department (40 beds) - 262, UXBRIDGE ROAD, W.

The OUT-PATIENT DEPARTMENT, rebuilt in 1905, contains Laboratory, Lecture Room. Electric Room fitted with Finsen Light, X Ray, High Frequency and Sabouraud's Treatment of Ringworm.

The OUT-PATIENT PRACTICE is open free to the Medical Profession every day from 2 to 4 p.m.

CLINICAL DEMONSTRATIONS are given every Monday (Dr. GRIFFITH) at 2 p.m.; Tuesday (Dr. BUNCH) at 2 p.m.; Wednesday (Dr. HARGREAVES) at 2 p.m.; Thursday (Dr. SIBLEY) at 2 p.m.; Friday (Dr. GRIFFITH) at 2 p.m.; Saturday (Dr. DOCKRELL) at 2 p.m.; on Selected Cases.

CHESTERFIELD LECTURES.

These Lectures are given by Dr. Morgan Dockrell on Thursday at 6 o'clock, during the Winter months, and are followed by Demonstrations and Clinical Instruction on Special Cases.

Full Particulars may be obtained from the Secretary.

GEO. A. ARNAUDIN, *Secretary-Superintendent.*

UNIVERSITY of ABERDEEN Founded 1494.

FACULTY OF MEDICINE.

THE Degrees in medicine granted by the University are—Bachelor of Medicine, Bachelor of Surgery, Doctor of Medicine, and Master of Surgery. They are conferred only after Examination, and only on Students of the University. Women are admitted to instruction and graduation on the same footing as men. A Diploma in Public Health is conferred after Examination on Graduates in Medicine of any University in the United Kingdom.

The Faculty of Medicine embraces twelve chairs, from which instruction is given in all the main branches of Medical Science.

Practical Classes in connection with these chairs are conducted by the Professors and Assistants in Laboratories furnished with all the necessary appliances; and opportunities are afforded to Students and Graduates to extend their practical knowledge and engage in original research.

Instruction is also given in special departments of Medical Practice by Lecturers appointed by the University Court.

Clinical instruction is obtained in the Royal Infirmary, Royal Lunatic Asylum, the Sick Children's Hospital, the City (Fever) Hospital, the General Dispensary, Maternity Hospital and Vaccine Institutions, and the Ophthalmic Institutions.

Bursaries, Scholarships, Fellowships and Prizes, to the number of **50** and of the Annual Value of **£1183** may be held by Students in this Faculty.

The cost of Matriculation, Class and Hospital Fees for the whole curriculum, inclusive of the fees for the Degrees, is usually about **£150.**

A Prospectus of the Classes, Fees, &c., may be had on application to the Secretary of the Faculty of Medicine.

J. THEODORE CASH, M.D., F.R.S., *Dean of Medical Faculty.*

The UNIVERSITY of LIVERPOOL

FACULTY OF MEDICINE.

Complete courses are provided for Degrees in Medicine, Surgery, and Dental Surgery, and for Diplomas in Dental Surgery, Public Health, Tropical Medicine, Veterinary Hygiene, and Pharmacy.

Prospectuses regarding the various courses, containing full information as to the Conditions, Fees, Scholarships, Fellowships, etc., may be obtained on application to the Registrar.

K. W. MONSARRAT, M.B., C.M., F.R.C.S., *Dean.*

Plaistow Hospital,

LONDON, E.

INSTRUCTION IN FEVERS, &c.

THIS Hospital has been rebuilt and fully equipped for instruction in Infectious Diseases. It is recognized by the Universities of London, Cambridge, and Oxford, the Royal Colleges of Physicians and Surgeons, &c.

I.—**Classes for Medical Students** are held on Tuesdays and Fridays throughout the year, except in April, August, and September. There is a Morning Class at 10.30; and an Afternoon Class at 2.30. FEE for a two months' course, **3** guineas; for a three months' course, **4** guineas. In the event of there being Small-pox cases at Dagenham Hospital during the Students' Course, instructions in that disease will be included.

II.—A three months' **D.P.H. Course** begins in October, January, and May. Lectures on Hospital Construction, Equipment, and Administration are included in this course. For FEES, apply as below.

Enquiries and applications to join the above courses should be addressed to

Dr. BIERNACKI, Medical Superintendent, Plaistow Hospital, E.

The Superintendent can also be seen at the Hospital on weekdays at 2 p.m.

The Hospital is situated near Upton Park Station, to which frequent trains run on the District and London and Tilbury Railways.

Charing Cross Hospital Medical School.

(UNIVERSITY OF LONDON.)

The most central and easily accessible of all the Colleges of the University, and situated within four minutes' walk of the University Laboratories (King's College).

The whole College has recently undergone the most extensive alterations and improvements in all Departments, adding greatly to its Educational Efficiency as the Central School of the University of London.

Its close proximity to the University Laboratories enables its Students to obtain the best Scientific Education in their Primary and Intermediate Studies, while still allowing them to use their School (Library, Club Rooms, &c.) for Study and Social purposes.

For the purposes of its Final Studies, the School now possesses most commodious Laboratories, Special Laboratories having been set aside for purposes of Post-Graduate Study and Research.

The Arrangements (Museum and other) for the School of Morbid Anatomy and Morbid Histology, &c., are very complete. All Departments of the Students' Club have been renovated and greatly improved, especially the Library, Reading Rooms, Dining Rooms, &c.

For Prospectus and full information apply personally or by letter to the Dean, who can be seen at the School every day between 10-12 a.m. and 2-5 p.m. WILLIAM HUNTER, M.D., F.R.C.P., *Dean.*

UNIVERSITY OF MANCHESTER

FACULTY OF MEDICINE.

CURRICULUM.—Complete Courses of instruction are offered to Students (Men and Women) preparing for Degrees in Medicine and Surgery, and in Science, for Degrees and Diplomas in Public Health and Dentistry, and for Diplomas in Veterinary State Medicine, Psychological Medicine and Pharmacy, and for the Qualifications of the Conjoint Board and other Licensing Bodies.

The University contains spacious and well-equipped Laboratories and Museums in all departments of Science and Medicine. For Women Students a separate Laboratory for Practical Anatomy and Special Common Rooms are provided.

The Prospectus of the Medical Faculty and the special Prospectuses for the following departments: Dental, Public Health, and Pharmaceutical, will be forwarded on application to THE REGISTRAR.

ST. ANDREWS UNIVERSITY

FACULTY OF MEDICINE.

THE SESSION 1911–12, commenced OCTOBER 11th, 1911.

The whole Curriculum may be taken in Dundee, or the first two years of the Course may be taken in St. Andrews, and the remaining three years in the Conjoint School of Medicine, University College, Dundee. The various Laboratories are fully equipped for teaching and for research.

CLINICAL INSTRUCTION is given at the Dundee Royal Infirmary, which has 400 beds, with special wards for Maternity cases, Diseases of Women, Diseases of Children, Diseases of the Eye, Diseases of the Ear, Throat, and Nose, Diseases of the Skin, Cancer, Incipient Insanity, and for cases requiring electrical treatment. Further instruction in Diseases of the Eye is given at the Dundee Eye Institution, which is attended by over 4000 patients annually. Clinical Instruction in Fevers is given at the Municipal Fever Hospital; and clinical instruction in Mental Diseases at the Dundee District Asylum, which has about 400 resident patients.

APPOINTMENTS.—Five Resident Medical Assistants, and an Outdoor Obstetric Assistant, are appointed annually at the Dundee Royal Infirmary. At the District Asylum the appointments include two qualified Resident Medical Assistants and two Resident Clinical Assistants.

BURSARIES.—At United College, St. Andrews, a Malcolm Medical Bursary of the annual value of £25 and tenable for five years, is open to men or women. Fourteen Taylour-Thomson Medical Bursaries of the annual value of £20 to £30, are limited to women. At University College, Dundee, twelve Entrance Bursaries of the value of £15 each, and fourteen Second and Third Year's Bursaries of the value of £20 and £15, are open to competition. Two Fourth and two Fifth Year's Bursaries of £20 each are open to Students who take the Complete Curriculum in University College. Other Bursaries, of which the patronage is vested in trustees, are available.

THE FEES for the Complete Course, exclusive of Examination Fees, amount to about £120. For further information, apply to the Secretary, at St. Andrews, or to

PROFESSOR KYNOCH, *Dean.*

CONJOINT SCHOOL OF MEDICINE, DUNDEE, *October*, 1911.

ROYAL EYE HOSPITAL, London School of Ophthalmic Surgery and Medicine.

ST. GEORGE'S CIRCUS, SOUTHWARK, S.E.

Consulting Physician—W. H. DICKINSON, M.D., F.R.C.P.
Consulting Surgeon—LORD LISTER, O.M., M.D., F.R.C.S., F.R.S.
Consulting Ophthalmic Surgeon—PROFESSOR MALCOLM M. MCHARDY, F.R.C.S. (EDIN.).
Physician—JAMES COLLIER, M.D., B.Sc. (LOND.), F.R.C.P.

Surgeons:

SIR W. J. COLLINS, M.D., M.S., B.Sc. (LOND.), F.R.C.S.; L. VERNON CARGILL, F.R.C.S.; G. BROOKSBANK JAMES, F.R.C.S.; H. WILLOUGHBY LYLE, M.D., B.S. (LOND.), F.R.C.S.

Assistant Surgeons:

J. STROUD HOSFORD, F.R.C.S. (EDIN.); A. D. GRIFFITH, M.B., B.S. (LOND.), F.R.C.S.; E. ARTHUR DORRELL, F.R.C.S.

Dean: J. STROUD HOSFORD, F.R.C.S.

Lectures, Demonstrations, Instruction in Refraction work, and Demonstrations on Pathological Specimens in the Museum are given throughout the Winter and Summer Sessions by the Teaching Staff of the Hospital. Clinical instruction is given daily in the Out-patient department at 10 a.m. and 3 p.m. During 1910 more than 21,000 *new* patients were registered at the Hospital. Ample opportunity for clinical experience is consequently afforded for those Students who desire to avail themselves of it. *For further particulars apply to the Dean.*

SAHAM COLLEGE, WATTON, NORFOLK.

Headmaster: REV. C. P. HINES, B.Sc., A.K.C. Lond.

Thorough preparation for Professional and Commercial careers, the Universities and the Great Public Schools. Excellent Preparatory department. Most healthy position on gravel soil. Bracing air. FEES inclusive: **10** to **12** Guineas per term, according to age. *Illustrated Prospectus on application.*

Entire charge taken of Colonial and Continental Boys.

Richmond, Whitworth and Hardwicke Hospitals,

DUBLIN.

THE SESSION 1911-12 commenced on October 2nd, 1911. These Hospitals for Surgical, Medical and Fever cases respectively, contain nearly 300 beds.

Physicians: Doctors O'Carroll, Coleman and Travers-Smith. **Assistant Physicians;** Doctors Matson, Purser and Nesbitt.
Surgeons: Sir Thomas Myles, Mr. R. J. Harvey, Mr. Conway Dyer. **Assistant Surgeons:** Mr. Slattery, Mr. McConnell, Mr. Crawford. **Consulting Surgeon:** Sir Thornley Stoker, Bart. **X Rayist:** E. J. M. Watson.
Ophthalmic Surgeon: Mr. Joyce. **Gynæcologist:** Dr. Gibson.
Laryngologist: Mr. Grabame. **Pathologist:** Dr. Earl.
Unqualified resident clinical clerks are appointed quarterly from any recognised school of medicine.

For Particulars apply to
R. TRAVERS-SMITH, M.D., 20 Lower Fitzwilliam Street, Dublin, *Hon. Sec. and Treasurer.*

University Examination Postal Institution,

Offices: 17 RED LION SQUARE, HOLBORN, LONDON, W.C.

Manager: MR. E. S. WEYMOUTH, M.A. (Lond.)

Postal or Oral Preparation for all Medical Examinations. 16 Medical Tutors, including 9 Gold Medalists.

Some Recent Successes:

M.D. (Lond.) 1901-1911—**181,** including **9 Gold Medalists.**
M.S. (Lond.) 1902-1911—**13,** including **3 Gold Medalists.**
M.R.C.P. (Lond.) 1910-1911—**8.** Conjoint Final 1909-1911—**15.**
D.P.H. (various) 1906-1911—**80.**
F.R.C.S. (Eng., Edin., Ireland)—**31.** Primary Fellowship (Eng.) 1907-1911—**26.**
R.A.M.C. Entrance—January 1912 Competition—**3.**
M.D. Durham (for Practitioners), 1903-1911—**29.** **M.D. (Brux.),** 1910-1911—**10.**
M.D. (Thesis), etc., numerous successes.

A list of successes gained in various Medical Examinations during the last 19 years supplied on application. This list does NOT include the private pupils of Tutors.

Samaritan Free Hospital for Women,

MARYLEBONE ROAD, N.W.

For the Treatment of Diseases peculiar to Women Only.

Entirely Dependent upon Voluntary Contributions for Support.
IN NEED OF IMMEDIATE HELP.

POST GRADUATES received as CLINICAL ASSISTANTS IN BOTH DEPARTMENTS: Fee 3 guineas per quarter.

For Particulars apply to W. GUNTRIP KING, *Secretary.*

JOHN WRIGHT & SONS Ltd., BRISTOL.
For CHARTS and CHART HOLDERS.

Samples to Hospitals Free on application.

UNIVERSITY of BRISTOL.

FACULTY OF MEDICINE.

The University affords complete courses of instruction for its own examinations, those of the University of London, and those of the Conjoint Board etc., for Medical Degrees or Diplomas. The Dental and Public Health Departments afford the necessary instruction for the Degrees and Diplomas of the University and of other examining bodies in those subjects.

The University confers the following Degrees and Diplomas :—

Bachelor of Medicine and Bachelor of Surgery	M.B., Ch.B.
Doctor of Medicine	M.D.
Master of Surgery	Ch.M.
Bachelor of Dental Surgery	B.D.S.
Master of Dental Surgery	M.D.S.
Licentiateship of Dental Surgery	L.D.S.
Diploma in Public Health	D.P.H.

The early part of the curriculum so interlocks with the curriculum for the B.Sc. that the Medical student may without much loss of time take also the degree of B.Sc. Moreover, the Dental student may in seven years take both Dental and Medical degrees. Magnificent Physiological and Chemical departments have recently been opened, and new laboratories have been provided for Mechanical Dentistry and Dental Metallurgy. The whole of the Dental Mechanical work for the Bristol Royal Infirmary is done in the University laboratory by the students, instructed by a skilled mechanic.

CLINICAL WORK is done at the Bristol Royal Infirmary, and the Bristol General Hospital, which together contain over 400 beds. The Bristol Royal Hospital for Sick Children and Women, the Bristol Eye Hospital, the Bristol City and County Asylum, and the Bristol City Fever Hospital are also open for the clinical instruction of students.

SCHOLARSHIPS.—There is no entrance scholarship, but students from the City of Bristol may, on their merits, receive financial aid from the City Scholarship Fund on application to the City Scholarship Committee.

Several Scholarships and Prizes are open to students during their Hospital career.

HOSPITAL APPOINTMENTS open to students after qualification.

At the Bristol Royal Infirmary.—Two House Surgeons, two House Physicians (of these one is chosen as Senior Resident Officer), one Resident Obstetric Officer, one Throat, Nose and Ear House Surgeon, one Ophthalmic House Surgeon, one Casualty Officer, and one Dental House Surgeon.

At the Bristol General Hospital.—One Senior House Surgeon, one Casualty House Surgeon, two House Physicians, one House Surgeon, and one Dental House Surgeon. All these appointments are salaried, with board and residence.

For further particulars and prospectus apply to the Dean of the Medical Faculty or the Registrar.

UNIVERSITY OF DURHAM

COLLEGE OF MEDICINE, NEWCASTLE-ON-TYNE.

DEGREES IN MEDICINE, SURGERY, AND HYGIENE; DIPLOMA IN PUBLIC HEALTH, AND LICENCE IN DENTAL SURGERY.—Six Degrees, one Diploma, and one Licence are conferred by the University of Durham—*viz.*, the Degrees of Bachelor of Medicine, Doctor of Medicine, Bachelor of Surgery, and Master of Surgery; Bachelor of Hygiene, and Doctor of Hygiene; the Diploma in Public Health, and the Licence in Dental Surgery. These Degrees, etc., are open to Men and Women.

Attendance at the University of Durham College of Medicine during one of the five years of professional study, or subsequently to qualification elsewhere, is required as part of the curriculum for the Degrees, except in the case of Practitioners of more than fifteen years' standing, who have attained the age of forty years, who can obtain the Degree of M.D. after examination only.

The first three Examinations for the Degree of M.B. may be passed prior to the commencement of attendance at Newcastle.

A candidate who has passed the First and Second Examinations of the University will be exempt from the First and Second Examinations of the Conjoint Board in England, and will be entitled to present himself for the Final Examination of the Board on the completion of the necessary curriculum. Students who have satisfied the requirements of the General Medical Council as regards Registration, in some Examination other than the Durham Matriculation, or its equivalent, may enter on a course of study for a degree in Medicine upon satisfying the Examiners of the University of Durham in *three* of the subjects of the Matriculation Examination (exclusive of Religious Instruction and Elementary Mathematics), provided that one of them is a language other than English. In the case of a Student who spends only one year at Newcastle, the necessary subjects of the Matriculation Examination must be passed at least 12 months previously to the candidate's entry for his Final Examination for the Degree.

Students can complete, at the University of Durham College of Medicine, Newcastle-upon-Tyne, the entire course of professional study required for the above degrees and for the Diploma in Public Health; also for the examinations of the Royal Colleges of Physicians and Surgeons, and for the Army and Navy Examination Boards.

A Dental curriculum is provided, and a Licence in Dental Surgery may be obtained after Examination.

All information, together with Examination Papers, etc., is given in the Calendar of the University of Durham College of Medicine, Newcastle-on-Tyne, which may be obtained gratis from the Secretary at the College.

Scholarships, &c.—University of Durham Scholarship, value £100 for proficiency in Arts awarded annually to full students in their first year only. The Pears Scholarship value £150—for proficiency in Arts. Dickinson Scholarship—value the interest of £400, and a Gold Medal—for Medicine, Surgery, Midwifery, and Pathology. Tulloch Scholarship—value the interest of £400—for Anatomy, Physiology, and Chemistry. Charlton Scholarship—value the interest of £700—for Medicine. Gibb Scholarship—value the interest of £500—for Pathology. Lake Armstrong Scholarship—interest on £680—for comparative Pathology. Stephen Scott Scholarship—interest on £1000—for promoting the study of Surgery and allied subjects. Heath Scholarship—the late George Yeoman Heath, M.D., M.B., D.C.L., F.R.C.S., President of the University of Durham College of Medicine, bequeathed the sum of £4000 to found a Scholarship in Surgery, the interest to be awarded every second year. Gibson Prize—value the interest of £225—for Midwifery and Diseases of Women and Children. The Turnbull Prize and Medal—for Surface Anatomy. The Goyder Memorial Scholarship (at the Infirmary)—value the interest of £325—for Clinical Medicine and Clinical Surgery. At the end of each Session, a Prize of Books is awarded in each of the regular Classes. Assistant Demonstrators of Anatomy, Prosectors, and Assistant Physiologists are elected yearly. Pathological Assistants, Assistants to the Dental Surgeon, Assistants in the Eye Department, Clinical Clerks and Dressers are appointed every three months.

The Royal Victoria Infirmary contains over 400 beds. Clinical Lectures are delivered by the Physicians and Surgeons in rotation. Pathological Demonstrations are given as opportunity offers, by the Pathologist; Practical Midwifery can be studied at the Newcastle Maternity Hospital, where there is an out-door practice of over 1000 cases annually.

FEES.

(*a*) A Composition Ticket for Lectures at the College may be obtained—

I.—By payment of 72 guineas on entrance.

II.—By payment of 46 guineas at the commencement of the First Year, and 36 guineas at the commencement of the Second Year.

III.—By three annual instalments of 36, 31, and 20 guineas respectively, at the commencement of the Sessional year.

(*b*) Fees for attendance on Hospital Practice:—

For 3 months' Medical and Surgical Practice, £6 6s. For 6 months' £10 10s. For 1 year's, £15 15s. For Perpetual, £36 15s.

Or by two instalments—First year, 20 guineas; Second year, 18 guineas.

In addition to the above fees, the Committee of the Royal Victoria Infirmary require the payment of 2 guineas yearly up to three years from every Student attending the Infirmary for a year or part of a year. After three years of attendance, such payment will be no longer necessary.

(*c*) Single courses of Lectures, 5 guineas.

(*d*) A Composition Ticket for the courses of Lectures and Practical work of the first two years of the curriculum, may be obtained by the payment of 40 guineas on entrance.

(*e*) Composition fee for Lectures, etc., at College for Licence in Dental Surgery, 34 guineas; Composition fee for Practical work at Dental Hospital, 35 guineas.

Fees for Lectures, etc., at the College must be paid to the Secretary. Fees for Hospital Practice to Dr. W. E. HUME, and fees for Practical Dental Work to the Dean of the Dental Hospital—at the time of entry.

Further particulars may be obtained from the Sec., PROF. HOWDEN, at the College.

UNIVERSITY OF EDINBURGH.

SESSION 1911-12.

Principal—Sir WILLIAM TURNER, K.C.B., D.C.L., LL.D., D.Sc., M.B.

The WINTER SESSION opens on the 4th of October and closes 15th March,
The SUMMER SESSION opens on 2nd May and closes 12th July.

FACULTY OF MEDICINE.

Dean—Professor HARVEY LITTLEJOHN, M.A., B.Sc., M.B., C.M.

The Faculty embraces thirteen Chairs and eighteen Lectureships; and attached to these Chairs there are about thirty assistants and Demonstrators. Instruction is given in all the main branches of Medical Science, viz.,

PROFESSORS.

Chemistry—James Walker, D.Sc., F.R.S.
Zoology—J. Cossar Ewart, M.D.
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I am indeed thankful to you for the cure you have effected in my daughter's stammering in the short time she has been under your guidance and advice. I know of no system so eminently calculated to cure functional impediment of speech as yours, and I consider your successes should be more widely known. Thanking you again, and wishing you increasing success.
Believe me, yours very sincerely (Signed)——, M.D.

DEAR SIR, *March 13th*, 1911.
I have great pleasure in 'estifying to the excellent results you have obtained in your treatment of Mr.——. Before he went to you he was a bad stammerer, he is now a fluent and confident speaker. Yours faithfully (Signed) ——, M.R.C.S., L.R.C.P.

DEAR SIR, *August 11th*, 1907.
The marvellous improvement effected by your system in the case of my patient, Mr. E. B., merits something more than a mere note of recognition. I can only say that during my professional experience of thirty years, I have never known anything to equal it. To be able to make a stutterer—the worst I have ever met—a perfect, fluent talker, after six weeks at your home, is something to be proud of. I am, dear Mr. Schnelle, yours very faithfully (Signed) ——, L.R.C.P.

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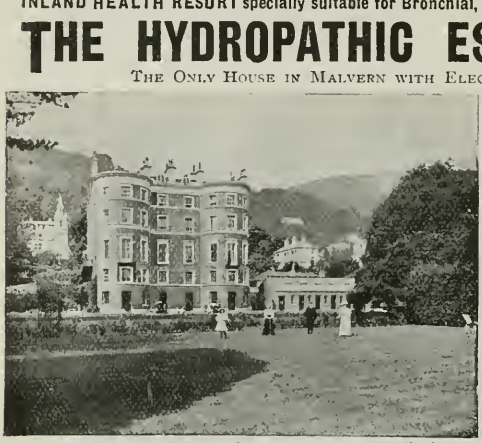

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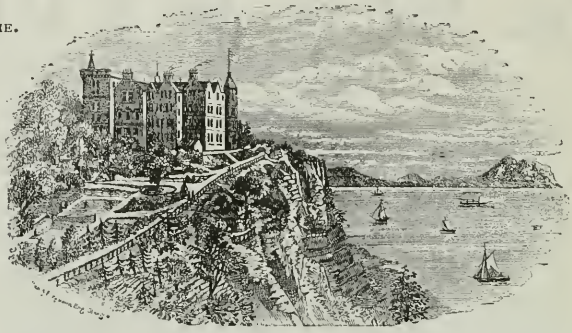

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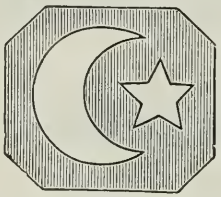

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(Licensed under the Inebriates' Acts)

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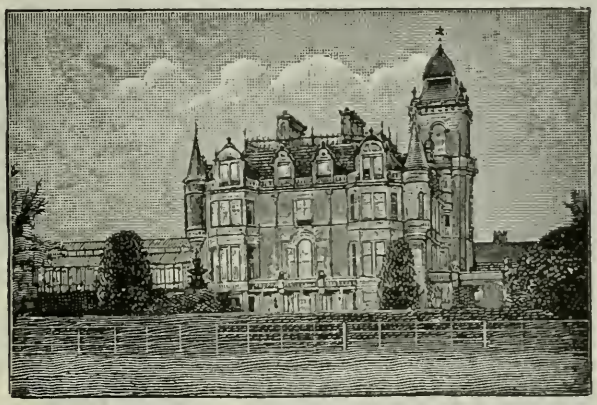


Neurasthenia is treated on approved principles, and there are Open-air Shelters in the grounds for suitable cases.

Inebriety and Narcomania are treated on definite medical lines, and the most approved scientific means are employed in the curative treatment. The Resident Medical Superintendent has each patient under his personal care and observation. The curative treatment is much aided by the healthy situation of the Sanatorium, and by its isolation from temptation.

The Sanatorium stands 450 feet above the sea, faces south, and looks out over the Firth of Forth. The climate is dry and bracing. All outdoor and indoor sports. First-class private golf course. Excellent mixed shooting over 1,600 acres, fishing, tennis, gardening, carpentry, etc. Billiard room (two tables), music room, large private library.

References to leading Physicians in the chief centres given on application.

For all particulars apply to the

Resident Medical Superintendent - W. H. BRYCE, M.B., C.M.

Telegrams: "Salubrious," Upper Largo.
Telephone: No. 8, Upper Largo.
Station:—Kilconquhar (N.B. Railway).

INEBRIETY. ALCOHOL AND DRUG ABUSE.

Established 1883, by the Homes for Inebriates Association.

DALRYMPLE HOUSE, RICKMANSWORTH, HERTS.

For the Treatment of Gentlemen, under the Act, and privately.

Large Grounds on the bank of the river Colne. Gravel Soil. Outdoor and Indoor recreations and pursuits. Half hour by Train from London. **TERMS: 2 to 4 Guineas Weekly.**

Apply to F. S. D. HOGG, M.R.C.S., Etc., Resident Medical Superintendent.

TELEPHONE: P.O. 16, RICKMANSWORTH.

BUNTINGFORD HOUSE
RETREAT AND SANATORIUM,
BUNTINGFORD, HERTS.

For Gentlemen suffering from Alcohol and Drug Inebriety; also for Gentlemen Convalescing after illness.

In a most healthy part of the country; 10½ acres of ground; about 350 feet above sea level. Electric Light throughout from private installation. Golf, Cricket, Tennis, Library, Billiards, Photographic Dark Room, Gardening, Carpenters' Shops, Poultry, etc., etc. ¼ mile from Station G.E.R.

TWO RESIDENT PHYSICIANS.

NO INFECTIOUS OR CONSUMPTIVE CASES TAKEN.

Inebriety Patients are admitted voluntarily only, either Privately or under the Inebriates' Act.

AN ENTIRELY NEW AND UP-TO-DATE SYSTEM OF DRAINAGE AND NEW BATHS AND LAVATORIES HAVE RECENTLY BEEN ADDED TO THE ESTABLISHMENT.

TERMS - FROM 2½ GUINEAS.

Telephone; P.O. 3, BUNTINGFORD.
Telegraphic Address: "SUPERINTENDENT, HILLSIDE, BUNTINGFORD."

NEWMAINS RETREAT

NEWMAINS, LANARKSHIRE.

LICENSED UNDER THE INEBRIATES ACTS.

THE House is devoted to the Care of LADIES of the Upper Classes only, who can be treated either under the Acts or as Voluntary Patients. The place stands high, and the estate is extensive, with bracing air, and in good shelter. It is very retired and beautiful, well suited for the treatment of inebriety, narcomania and other perversions, neurasthenia, hysteria, and minor mental ailments.

No patients under certificates of insanity can be received.

References: DR. CLOUSTON, DR. YELLOWLEES, DR. RISIEN RUSSELL, and others.

Terms and particulars on application to—

Superintendent, The Retreat, Newmains, N.B.

Nearest Station, Hartwood, Cal. Railway.

SIDLOW MANOR, REIGATE.

Patients Received for Treatment of Inebriety and the Abuse of Drugs.

FOR LADIES ONLY.

LARGE GARDENS, BEAUTIFUL COUNTRY: EVERY COUNTRY HOUSE COMFORT.

Terms: From Two and a Half Guineas a Week.

PATRONS: Sir Thomas Barlow, Bart., M.D. Sir Lauder Brunton, Bart., M.D., Sir Bertrand Dawson, M.D., C. A. Mercier, Esq., M.D., Sir G. H. Savage, M.D., Mrs. Scharlieb, M.D., A. T. Schofield, Esq., M.D., Sir Thornley Stoker, M.D., Theodore Thompson, Esq., M.D., Leonard Williams, Esq., M.D., The Lady Henry Somerset.

For information apply to the SISTER SUPT.

SPELTHORNE S. MARY & S. BRIDGET'S,

BEDFONT, FELTHAM, MIDDLESEX.

Licensed under the Inebriates Acts, 1878—1900.

Instituted for the Reform—Physical, Moral and Spiritual—of Women of the Upper and Middle Classes. The House, to which a Chapel is attached, stands in beautiful grounds. It is in the charge of Sisters of the Community of St. Mary the Virgin (Wantage).

All communications to be addressed to the SISTER SUPERIOR.

THE GROVE RETREAT FOR INEBRIATE WOMEN,

FALLOWFIELD, near MANCHESTER.

Pleasantly situated in its own well-wooded Grounds of three acres, and convenient to tram and train.

LICENSED UNDER THE INEBRIATES ACTS. RECEIVING 25 PATIENTS.

For terms and further particulars apply to THE MATRON.

A TEMPERANCE HOME FOR LADIES,

And HOME FOR INVALID and AGED LADIES
Requiring Special Care and Attention.

QUEENSBERRY LODGE, HOLYROOD
EDINBURGH.

Ordinary Directors—Lewis Bilton, Esq., W.S. (*Chairman*); The Right Honourable the Lord Provost; The Sheriff; The Dean of Guild; Wm. Thomson, Junr., Esq., C.A.; A.W. Robertson-Durham, Esq., C.A.: Lieut.-Colonel Surg. K. M. Downie; Rev. Thomas White; John Kerr, Esq., LL.D.; W. Ormiston, Esq., J.P.; Sir James A. Russell, M.D.; Councillors Hunter, Moscrip, and Robertson.

Consulting Physician—
Visiting Physician—William Russell, M.D., F.R.C.P.E.
Governor and Treasurer—A. Miller, Esq. *Matron*—Miss Riddell.

Rates of Board from £50 to £100 per annum.

Particulars may be obtained from the Governor, Queensberry Lodge, Edinburgh.

. NORWOOD .
SANATORIUM.
FOR THE TREATMENT OF
ALCOHOLISM and other
. . DRUG HABITS.
Under an Advisory Committee
of influential Medical Men.
Removed to THE MANSION, BECKENHAM PK., KENT.
Telegrams—"Norotorium, Beckenham."
Telephone—648 Bromley.
—For Illustrated Prospectus, etc., apply to FRANCIS HARE, M.D., Med. Supt.—

Homes for Inebriate Men and Women

The Church of England Temperance Society's Institutions for those with slender means.

FOR MEN—

ABBOTSWOOD HOUSE, CINDERFORD, Gloucestershire
Private Room (when available), £2 2s. weekly. Terms: First Class, 25s.; Intermediate, 15s.; Second Class, 10s. weekly.

FOR WOMEN—

ELLISON LODGE, HERNE HILL, S.E.
Terms: Drawing Room, 21s., 25s. and £2 2s.; Work-room, 10s. 6d., 12s. 6d. and 15s.; Kitchen, 7s 6d. weekly.

CORNGREAVES LODGE, ERDINGTON, BIRMINGHAM.
Terms: Drawing-Room, 25s. and £2 2s.; Work-Room, 12s. 6d., and 15s.; Kitchen 7s. 6d. weekly.

Hamond Lodge, Terrington St. Clement, King's Lynn, Norfolk.
Terms: Drawing-Room, 21s., 30s., and £2 2s.; Work-room, 10s. 6d., 12s 6d., and 15s.; Kitchen, 7s. 6d. weekly,

TEMPLE LODGE, TORQUAY.
Terms: Drawing-Room, 21s. and £2 2s.; Work-Room, 10s. 6d., 12s. 6d., and 15s.; Kitchen, 7s. 6d. weekly.

No Patient received for less than 12 months. No Female Patient over 50 Years of age admitted.

Application for Forms and Particulars to:
Rev. GERALD A. THOMPSON. Secretary C.E.T.S., 4 The Sanctuary, LONDON, S.W.

Telegrams: "DICKSON, BUXTON." *National Telephone:* 130, BUXTON.

WYE HOUSE ASYLUM, BUXTON, DERBYSHIRE.

ESTABLISHED IN 1858, FOR THE

Care and Treatment of the INSANE of the Higher and Middle Classes.

THE NEW INSTITUTION COMPLETED 1901.

Resident Physicians GRÆME DICKSON, L.R.C.P., & S. Ed., L.R.F.P.S. Glasg., *Med. Supt.*; *and* ASSISTANT MEDICAL OFFICERS at Buxton and in N. Wales.

Chaplain: Rev. Canon SCOTT-MONCRIEFF, M.A., D.D. (Vicar of Buxton and Rural Dean).

THIS Institution has been established for the **Reception of Patients of Both Sexes of the Higher and Middle Classes**, for whom it is admirably adapted by its position and appointments. It is erected on an eminence surrounded with scenery of the most varied character, and the views from the House and Terraces extend over many miles of picturesque country. There is also in connection a Summer Residence on the coast of North Wales. The House is furnished throughout on the most liberal scale, and fitted up and arranged as a Gentleman's Family Residence. Voluntary Boarders can be received.

The Sanitary arrangements and Ventilation are modern in design and *perfect* in construction, and are certified to be so by the Sanitary Authority.

The Medical Superintendent lives in the House, and is assisted in his duties by two Assistant Physicians, and an experienced Lady Superintendent.

Every exertion is made to promote health and comfort, both by moderate bodily employment and by variety in amusements, such as reading, music, drawing, excursions, golf, billiards, croquet, lawn tennis, theatricals, re-unions, etc. A library is provided, containing some 2,000 works of varied character, suited to the condition of the patients; also periodicals, magazines, and newspapers. Motor exercise is provided.

Due provision is made for the spiritual welfare and consolation of the Patients, and Divine Service is held every Sunday in the Institution.

The Pleasure Grounds, which are very spacious, have been laid out in the most tasteful manner especially for the recreation of the Patients; and contain conservatories, lawns for croquet and tennis, a private golf course, and other out-door games; also a theatre, two billiard rooms, and workshop for the in-door occupation of Patients. The House is heated throughout by means of hot-water apparatus and open fireplaces.

Buxton is directly accessible by the Midland and the L. & N.W. Railways. It is situated on the mountain limestone formation, 1000 feet above sea level. Being a watering-place, it affords exceptional advantages and varied recreations to convalescent Patients.

Particulars of Terms and Forms of Admission on application to THE MEDICAL SUPERINTENDENT.

STRETTON HOUSE,

CHURCH STRETTON, SHROPSHIRE.

A Private Licensed House for the treatment of Gentlemen suffering from any sort of Mental Disease.

ESTABLISHED 1853.

SITUATED amongst charming scenery, 600 ft. above the sea, large grounds, pure water, perfect sanitation, and the bracing air of the "English Highlands."

Accessible from all parts. Good train service on G.W. and L. & N.W.R. Station within one mile.

Constant occupation and congenial recreation are specially attended to, and all sorts of indoor and outdoor amusements are provided.

The extensive Grounds, Farmery, and Workshops provide ample occupation. The splendid hill climate is most beneficial.

For the Terms, which are moderate, apply to the RESIDENT MEDICAL PROPRIETOR.

Telegrams—Stretton House, Church Stretton. *Telephone*—P.O. 10, Church Stretton.

KINGSDOWN HOUSE,

BOX (Near BATH).

— Telephone: No. 2 Box. —

LICENSED FOR THE TREATMENT OF DISEASES OF THE BRAIN AND NERVOUS SYSTEM.

THIS House is situate 450 feet above sea level, and commands extensive views of the surrounding country.

Access—Box Station (G.W.R.); Bath Stations (Midland and G.W.R.) twenty minutes from the house.

Visiting Physician: **J. F. WOODS, M.D., 7, Harley Street, LONDON, W.**

For Terms apply to—

Dr. H. C. MacBRYAN, *Resident Proprietor & Medical Superintendent, at the above,*

Or at 17, BELMONT, BATH. *Telephone:* No. 636, BATH.

FOR THE

Treatment of Mental Diseases.

SHAFTESBURY HOUSE,

FORMBY-BY-THE-SEA,

Telephone: No. 8 FORMBY. *Near* **LIVERPOOL.**

Resident Licensees:

STANLEY A. GILL, B.A., M.D., M.R.C.P. Lond.,
Formerly Medical Superintendent to the Liverpool Lunatic Asylum.

EUSTACE STANLEY HAYES GILL, M.B. Ch.,
Liverpool University.

MRS. STANLEY GILL, & MISS VIOLET FLORENCE GILL.

Visiting Physician:

T. R. GLYNN, M.D., F.R.C.P.Lond.,
Consulting Phys. Liverpool Infirm., & Prof. of Med. Univ. Coll. Liverpool.

Consulting Surgeon:

W. THELWALL THOMAS, F.R.C.S.Eng., M.S.,
Liverpool University.

THIS House, specially built and licensed for the care and treatment of a limited number of Ladies and Gentlemen mentally afflicted, is delightfully situated near the coast between Liverpool and Southport, so that patients have the benefit of pure bracing sea air, for which Formby is noted. The House is in the country, and stands in several acres of ornamental well-wooded grounds, the surroundings being in every way bright, cheerful and pleasant. As the Licensees reside on the premises they are able to devote the whole of their time to the constant supervision of the patients. All kinds of out-door and in-door amusements and occupation provided. Voluntary Boarders without certificates admitted.

TERMS MODERATE - Apply MEDICAL SUPERINTENDENT.

The Licensees have also a Private Residence at Llandudno, North Wales, for the treatment of mild borderland and convalescent patients.

Dr. STANLEY GILL and Dr. HAYES GILL may be consulted at 30, RODNEY STREET, LIVERPOOL, from 2 0 till 4.0 p.m. every Monday and Thursday.

BOREATTON PARK

THIS PRIVATE ASYLUM, which was founded by the late W. H. O. SANKEY, M.D., F.R.C.P., for the reception of a limited number of

Ladies and Gentlemen MENTALLY AFFLICTED,

—— is now conducted by his son, ——
E. H. O. SANKEY, M.A., M.B., B.C. Cantab.

The Ladies' Division is directly supervised by Mrs. SANKEY.

The Mansion stands high, among handsomely laid out gardens in the midst of a picturesque deer park (about 70 head of deer are kept), and commands a magnificent view of Welsh mountain scenery.

Carriages, horses, motor, lawn-tennis, golf, trout and other fishing are provided.

Arrangements can be made to enable friends of patients to reside in the House as Boarders if so desired.

The Asylum is situate about ten miles from Shrewsbury, within easy distance of Baschurch Station, G.W.R., whither carriages can be sent at any time for visitors.

Letters and Telegrams should be addressed to—

DR. SANKEY, Boreatton Park, BASCHURCH, SALOP.

THE RETREAT, YORK. *ESTABLISHED 1792.*

A Registered Hospital for the Treatment of Mental Diseases.

Under the management of a Committee of Members of the Society of Friends. Situated about two miles from York Station. The Patients are derived from the **Upper and Middle Classes**, and none are paupers or rate-aided. **Terms from 48/- weekly.**

Voluntary Boarders are received on their own application.

For further particulars as to the resources of the Institution, and information respecting the admission of Patients, see the Annual Report, which will be sent on application to Dr. BEDFORD PIERCE, the Medical Superintendent. *Nat. Telephone:* 112 **York.**

THROXENBY HALL, Near SCARBOROUGH.

A Branch House connected with The Retreat, York, situated near the Raincliffe Woods, about two miles from Scarborough, for the reception of **Convalescent Patients**, also for the treatment of persons suffering from **Incipient or Mild Forms of Mental Disorder** who cannot be certified as of unsound mind, and who wish voluntarily to place themselves under skilled treatment.—For further particulars apply to the Matron, or to Dr. BEDFORD PIERCE, at THE RETREAT, YORK. *Nat. Telephone:* 282 **Scarborough.**

RETREAT TRAINED NURSES DEPARTMENT.

Staffed by Nurses who have been trained for four years in The Retreat, and conducted upon a profit-sharing basis. MENTAL and NERVOUS CASES only undertaken.

Terms Two Guineas Weekly. Apply MATRON, Retreat, York. Nat. Tel. 112.

Croydon Mental Hospital,

UPPER WARLINGHAM, SURREY.

SALUBRIOUSLY SITUATED AT 650 FEET ABOVE THE SEA LEVEL.

PAYING PATIENTS RECEIVED.

Nat. Telephone: 410 Croydon. *Apply to the Medical Superintendent.*

BETHEL HOSPITAL, NORWICH

ESTABLISHED A.D. 1713.

THIS Institution is an endowed Hospital, registered under the Lunacy Acts, and managed by a Board of Governors who have no pecuniary interest in its success, but whose sole object is to promote the comfort and well-being of the Patients.

The Hospital is arranged for both sexes, and is especially adapted for those whose means will not permit of their being sent to an expensive and luxurious Institution for the Insane, and who may object to the associations of a pauper asylum.

The terms for admission are **thirty shillings per week or more,** according to Patients' condition and circumstances, which includes everything, except clothing, carriage exercise, or any expenses incurred for amusement beyond the Hospital grounds.

CONSULTING PHYSICIAN:
SAMUEL J. BARTON, Esq., M.D.
(Consulting Physician to the Norfolk and Norwich Hospital).

RESIDENT MEDICAL SUPERINTENDENT:
SAVILLE J. FIELDING, M.B.

CLERK TO THE GOVERNORS:
FRANCIS HORNOR, QUEEN STREET, NORWICH.

MATRON:
MISS OXLEY *(Late Sister Guy's Hospital, London).*

APPLICATION FOR ADMISSION TO BE MADE TO THE
Resident Medical Superintendent, BETHEL HOSPITAL, NORWICH.

COTON HILL
HOSPITAL FOR THE INSANE,
NEAR STAFFORD.

Chairman of the Committee of Management—
THE RIGHT HONOURABLE THE EARL OF DARTMOUTH.

THIS HOSPITAL, which is beautifully situated in a high and healthy position, with extensive grounds, Cricket Field, Lawn Tennis Courts, Golf Links, etc., is devoted to the CARE AND TREATMENT OF THE MENTALLY AFFLICTED OF THE UPPER AND MIDDLE CLASSES.

PRIVATE ROOMS with Special Attendants in the Hospital, or semi-detached Villas in the grounds, can be arranged. **Terms on application.**

For further particulars apply to R. W. HEWSON, L.R.C.P. & S. Ed. (Ed. Univ.) Med. Supt.

THE PLEASAUNCE,
YORK.

A PRIVATE HOME FOR LADIES ONLY OF THE UPPER AND MIDDLE CLASSES.

Ladies can be received either as VOLUNTARY PATIENTS or certified under the Lunacy Act, 1890.

Apply to **DR. SWANSON, Resident Medical Proprietor.**

SPRINGFIELD HOUSE

NEAR BEDFORD.

(TELEPHONE No. 17. **Within an hour of London by Midland.**)

AN INSTITUTION FOR THE

CARE AND CURE OF THE INSANE.

Under the Personal Direction of the Licensees:

DAVID BOWER, M.D.

(Late Resident Medical Superintendent of Saughton Hall Asylum, Edinburgh;)

MR. W. S. BOWER AND MISS BELLARS,

(ASSISTED BY LADIES' AND GENTLEMEN'S COMPANIONS.)

DR. BOWER attends at 5, Duchess Street, Portland Place, W., on Tuesdays, from 4 to 5.

Ordinary Terms = Three Guineas per week.
Including separate bedrooms for all suitable cases.

Vacancies are advertised each week in the *British Medical Journal* and the *Lancet.*

The Lawn, Lincoln.

A REGISTERED HOSPITAL FOR MENTAL DISEASES, situated in the City of Lincoln, near to the Cathedral.

FOR TERMS, APPLY TO

DR. RUSSELL, *Resident Medical Superintendent.*

HERRISON,

DORCHESTER ASYLUM.

This **Home for Private Patients** is delightfully situated, with all modern conveniences for the treatment of the Insane. Terms on application to the MEDICAL SUPERINTENDENT, Herrison, Dorchester.

Telegrams: "HERRISON, CHARMINSTER."

East Sussex County Asylum

HELLINGLY MENTAL HOSPITAL.

ACCOMMODATION is provided for PRIVATE PATIENTS in the Hospital at £1 4s. 6d. per week, and in addition two wards of the Main Building have been set aside for the same purpose, at a reduced charge of One Guinea per week for each person from the Administrative County of East Sussex, and £1 2s. 9d. for each person from outside the County, to include all things necessary except clothing.

The main and detached building of this new Institution have been built on the most modern principles, and everything possible has been done to ensure the comfort and cure of those mentally afflicted.

The estate comprises 400 acres, and is situated on high ground nine miles north of Eastbourne, and four miles west of Pevensey Bay. There is a separate detached block for Children.

For particulars apply to the MEDICAL SUPERINTENDENT.

Telegrams: "ENVOY, LONDON." Telephone: 5608 Central.

ST. LUKE'S HOSPITAL

For Mental Diseases,

ESTABLISHED 1751. ✠ **OLD STREET, LONDON.**

FOR THE TREATMENT OF MENTAL DISEASES. Admission on payment of 15/- to 42/- per week. In certain circumstances Patients are received gratuitously.

Convalescent Establishment at **St. Lawrence-on-Sea, Thanet.**

Country Convalescent Establishment, near Gerrards Cross, Bucks, standing in 130 acres of Park, Ornamental Gardens, and Grounds. ::

VOLUNTARY BOARDERS (LADIES) ARE RECEIVED :: AT BOTH THE ABOVE CONVALESCENT HOMES. ::

TRAINED NURSES supplied from the Private Nursing Staff for nursing Mental and Nervous cases at their own homes.

Full particulars on application to the Secretary at the Hospital ✠ **W. H. BAIRD, Secretary.**

Established 1826.

PECKHAM HOUSE,

— 112, PECKHAM ROAD, LONDON, S.E. —

Telegrams: "Alleviated, London." Telephone: 1576 Hop.

An Institution licensed for the CARE and TREATMENT of the MENTALLY AFFLICTED of Both Sexes. Conveniently situated. Electric trams and omnibuses from the Bridges and West-End pass the House. Private houses with electric light for suitable cases adjoining the Institution. Holiday parties sent to the Seaside branch at Worthing during Summer months.

— Moderate Terms: —

Apply to MEDICAL SUPERINTENDENT for further particulars.

ISLE OF WIGHT ASYLUM.

LADY PRIVATE PATIENTS.

A DETACHED Residence for Lady Private Patients is now in occupation in connection with this County Asylum.

The building is beautifully situated in the centre of the island, in a warm and healthy climate, and fitted with the electric light and other modern conveniences.

Provision is made for amusement by dances, concerts, etc, and for employment and treatment.

TERMS:—from 21/- WEEKLY.

Apply to the Medical Superintendent:—

— WHITECROFT, CARISBROOKE, ISLE OF WIGHT. —

BETHLEM ROYAL HOSPITAL,

LAMBETH ROAD, LONDON, S.E.

LADIES AND GENTLEMEN of the Educated Classes, suffering from NERVOUS OR MENTAL DISORDERS of short duration, are received for treatment at a fixed fee of **2 guineas** a week. Voluntary Boarders are also received.

Medical Supt.: Dr. W. H. B. STODDART, F.R.C.P.

To whom all applications should be addressed.

CONVALESCENT HOME at WITLEY, SURREY.

Incorporated by Royal Charter.

James Murray's Royal Asylum, Perth.

Chairman—**The Rt. Hon. The Earl of Mansfield.**

THIS Asylum, for Private Patients only, is beautifully situated in the immediate vicinity of Perth, in the midst of extensive Pleasure Grounds, which are surrounded by the fields of the Home Farm.

The Main Building has been entirely re-organized and enlarged by the addition of *two wings*, for the reception of acute cases, so as to render it an efficient *Hospital* as well as a comfortable *Home*.

The Mansion-House of PITCULLEN, SEVEN GABLES, Elie, and THE EAST AND WEST VILLAS, afford the necessary variety of accommodation for modern treatment. Consumptive Patients are separately treated in Sanatoria.

National Telephone Company: No. 104, Perth.

Postal and Telegraphic Address: Dr. Urquhart, Perth.

CAMBERWELL HOUSE

33, Peckham Road, LONDON, S.E.

Telephone: No. Hop. 1037. Telegrams: "PSYCHOLIA, LONDON."

For the Care and Treatment of those of Both Sexes suffering from NERVOUS and MENTAL DISORDERS.

CONSISTS of separate Houses, lit by electricity and completely modernised, standing in 20 acres of picturesque grounds, including cricket and football field, tennis court, and croquet lawns. The Terrace Houses are quite separate from the rest of the Institution, and are specially adapted for the reception of Mild and Borderland Cases, who can enter voluntarily.

The ordinary Terms are **2 guineas** per week. Patients can have separate sitting and bedrooms, with a special nurse, as well as the use of the general rooms.

HOVE VILLA, BRIGHTON.—A CONVALESCENT HOME in connection with Camberwell House for suitable Mental and Nervous Patients of both sexes.

For further particulars apply to the MEDICAL SUPERINTENDENT at the above address.

ESTABLISHED 1814.

NORTHUMBERLAND HOUSE,

GREEN LANES, FINSBURY PARK, N.

Telephone No.: 888 North. Telegrams: "Subsidiary," London.

An INSTITUTION for the Care and Treatment of the MENTALLY AFFLICTED of the UPPER and MIDDLE CLASSES.

Four miles from Charing Cross; nearest Station, Finsbury Park (G.N. and N. London Railways); Tubes to City and West End. Electric Cars from Finsbury Park Station run every few minutes past the gates.

Six acres of ground, highly situated, facing Finsbury Park.

Private Villas, in suites of rooms.

TERMS, from **2½ guineas** upwards, according to accommodation provided.

For further particulars apply to RESIDENT PHYSICIAN.

ASHWOOD HOUSE,

KINGSWINFORD, STAFFORDSHIRE.

An old-established and modernized Institution for the Medical Treatment of Ladies and Gentlemen Mentally Afflicted.

THE House, pleasantly situated, stands in picturesque grounds of forty acres in extent, with a surrounding country noted for the beauty of its walks and drives. The climate is genial and bracing. Occupation, indoor and outdoor amusements, and carriage and other exercise amply provided.

TERMS range from **3** to **7** guineas per week, inclusive, according to requirements as to accommodation, special attendance, etc.

Railway Stations: Stourbridge Junction (G.W.R.), 3½ miles; Dudley (L. & N.W.R.), 4 miles; Wolverhampton (G.W.R. or L. & N.W.R.), 7 miles. Intending visitors can be met at any of these Stations.

FOR FURTHER PARTICULARS APPLY TO THE MEDICAL SUPERINTENDENT.

St. George's Retreat, Burgess Hill, Sussex.

THIS PRIVATE ASYLUM is under the Management of Augustinian nuns. It receives Lady Patients only, who are under the immediate care of the Sisters. A Chaplain and a Medical Man reside in the house, and the Patients are also visited regularly by a physician of special experience. The establishment is supplied with every requisite for the treatment and well-being of the Patients; and the grounds (of 280 acres) in which it stands afford ample space for their recreation and exercise. It is within two miles of Burgess Hill Station, on the London and Brighton Railway, and is easily accessible from all parts of the kingdom.

For particulars and terms apply to **THE REV. MOTHER SUPERIOR, ST. GEORGE'S RETREAT.**

CORPORATION MENTAL HOSPITAL

PORTSMOUTH.

ACCOMMODATION is provided for LADIES and GENTLEMEN in Two Detached Villas, recently opened, at a charge from **£1 11s. 6d.** upwards, including all necessaries except clothing.

APPLY - - MEDICAL SUPERINTENDENT.

BARNWOOD HOUSE,
GLOUCESTER.

A REGISTERED HOSPITAL for PRIVATE PATIENTS Only, of the UPPER and MIDDLE CLASSES.

ARRANGED and furnished with all the most approved appliances for the treatment, comfort, and amusement of the Inmates. Within two miles of the Railway Station, and easily accessible by Rail from London and all parts of the kingdom. It is beautifully situated at the foot of the Cotswold Hills, and stands in its own grounds of 250 acres.

For terms, etc., apply to JAS. GREIG SOUTAR, M.B., C.M.,
TELEPHONE No. 307. *Resident Superintendent.*

PLYMPTON HOUSE,
PLYMPTON, SOUTH DEVON
ESTABLISHED 1834.

PLYMPTON HOUSE is licensed for the accommodation of both sexes, and is well adapted by its position and appointments for the medical treatment and care of Patients of the Upper and Middle Classes, suffering from MENTAL DISEASE.

The proprietors, Dr. ALFRED TURNER and Dr. J. C. NIXON, have had very large experience of Mental cases, both in public and private institutions, and everything that can be done to ameliorate the condition of the chronic, and promote the cure of the acute cases—placed under their charge—is guaranteed.

TERMS ON APPLICATION. *Letters and Telegrams:*
Telephone: No. 2 PLYMPTON. DR. TURNER, PLYMPTON.

OTTO HOUSE,
47, North End Road, West Kensington, W.
Telephone: No. 1004 Hammersmith.

A HOME FOR THE CARE AND TREATMENT OF LADIES MENTALLY AFFLICTED.

Apply to Mrs. CHAPMAN (Resident Lady Superintendent), or to A. H. SUTHERLAND (Licensed Propr.), 2a Marloes Road, Kensington, W.

NEWLANDS HOUSE,
Telephone: No. 524 Streatham. **Tooting Bec Road, Tooting, S.W.**

A HOME FOR THE CARE AND TREATMENT OF GENTLEMEN MENTALLY AFFLICTED.

Apply to DR. J. NOEL SERGEANT (Resident Medical Superintendent).

THE WARNEFORD,

HEADINGTON HILL, OXFORD.

A Registered Hospital for the Care and Treatment of both Sexes of the Upper and Middle Classes, when suffering from Nervous and Mental Disorders.

President—THE RIGHT HON. THE EARL OF JERSEY.
Chairman of the Committee—
THE REV. WILLIAM ARCHIBALD SPOONER, D.D., Warden of New College, Oxford.
Vice-Chairman—SURGEON-GENERAL BRADSHAW, C.B.

The Regular Charge for Patients is £2 2s. a week, but the Committee have power to alter the charges at their discretion, as the circumstances of cases require.

The building is arranged, so far as is compatible with the requirements of a Mental Hospital, in the manner of an ordinary private residence.

The Hospital possesses an Endowment Fund, arising from numerous grants of the late Dr. SAMUEL WILSON WARNEFORD and others. When a reduction of the ordinary charge is asked, a special statement of the circumstances of the Patient must accompany the application for Admission.

For further particulars, apply to the Medical Superintendent, JAMES NEIL, M.D.

THE GRANGE, Near ROTHERHAM,

A SANATORIUM OF THE HIGHEST CLASS FOR THE

CARE & CURE OF MENTAL INVALIDS (LADIES).

Consulting Physician: CROCHLEY CLAPHAM, M.D., F.R.C.P.E.
Resident Physician: G. E. MOULD, M.R.C.S. Eng., L.R.C.P. Lond.
Physician for Mental Diseases to the Sheffield Royal Hospital.

THE House is a spacious Family Mansion, with extensive pleasure grounds, including good Croquet and Tennis Grounds, and an immense Park, containing Private Drives and Walks of several miles in extent. It is situated in the heart of the famous Robin Hood Country (5 miles from Sheffield, 4 from Rotherham), and is surrounded by beautiful scenery, and an atmosphere free from smoke and impurity. Situation dry and healthy. The arrangements are of a domestic character. The Proprietors welcome visits from the usual Medical Attendant of the Patient during her residence. Under the New Act Voluntary Patients can be received, without Certificates, on own personal application. The Rev. R. T. C. SLADE, Mus. Bac., Vicar of Thorpe-Hesley, acts as Chaplain, and conducts regular Services.

The Resident Physician may be seen at the Grange; or at Leavygreave House, Hounsfield Road, Sheffield, by appointment. (Nat. Tel. No. 34, Rotherham.)

GRANGE LANE STATION (M. S. & L. Railway) is within a quarter of a mile of The Grange, and may be reached via Sheffield or Barnsley direct: or via Rotherham, changing at Tinsley

FOR TERMS, FORMS, &C., APPLY TO THE RESIDENT PHYSICIAN.

NORTHWOODS HOUSE,

WINTERBOURNE, near BRISTOL.

A Sanatorium for Ladies and Gentlemen suffering from Nervous and Mental Disorders.

Situated in a large Park, 300 feet above sea level, in a healthy and picturesque locality, easily accessible from London, Bristol, and Cardiff by Winterbourne Station; or from Fishponds, Yate, or Patchway Stations.

Voluntary Boarders received without Certificates.

For further information, see London Medical Directory, p. 2103, and for Terms, etc., apply to Dr. EAGER, or Dr. J. D. THOMAS, Resident Medical Proprietors, Northwoods House.

Dr. EAGER *or* Dr. THOMAS *attends at* 64, *PARK STREET, BRISTOL, on Mondays and Thursdays, from* 12 *to* 3 *o'clock.*
TELEPHONE NO. 18 WINTERBOURNE.

HOLLOWAY SANATORIUM,

VIRGINIA WATER.

A Registered Hospital for the CURE and CARE of the INSANE and of NERVOUS INVALIDS of the MIDDLE and UPPER CLASSES.

THIS Institution is situated in a beautiful and healthy locality, within easy reach of London. It is fitted with every comfort. Patients can have Private Rooms and Special Attendants, as well as the use of General Sitting Rooms, at moderate rates of payment. Voluntary Boarders not under Certificates can be admitted. There is a branch establishment at Canford Cliffs, Bournemouth, where Patients and Boarders can be sent for a change, and provided with all the comforts of a well appointed home.

For Terms, apply to the RESIDENT MEDICAL SUPERINTENDENT,
St. Ann's Heath, Virginia Water, SURREY.

THE SILVER BIRCHES,

CHURCH STREET, EPSOM.

This Home has been established over fifty years for the Care and Treatment of Ladies suffering from Mental Ailments.

TERMS, Etc., on application to—
MISS M. O. DANIEL, *Res. Licensee*, or to Dr. E. C. DANIEL, *Co-Licensee.*
Telephone: 346 P.O. Epsom.

BETHNALL HOUSE ASYLUM,

Cambridge Road, LONDON, N.E.

FOR THE INSANE OF BOTH SEXES.

—— Terms on application. ——

J. KENNEDY WILL, M.A., M.D., Resident Medical Superintendent.

CITY of LONDON MENTAL HOSPITAL

Near DARTFORD, KENT.

PRIVATE PATIENTS are received from **£1 1s.** per week for each person, and **£2 2s.** per week for Ladies in HILL HOUSE, to include all things necessary except clothing.

The Institution is situated on an elevated site between Dartford, and Greenhithe, and is about sixteen miles from London on the S. E. R. It has been recently remodelled, renovated, and lighted by electricity throughout. The Estate comprises 207 acres.

Cricket, Football, Hockey, Golf, Tennis, Billiards, Dances, Theatricals, and other amusements are amply provided.

For particulars apply to **Medical Superintendent, STONE HOUSE, near DARTFORD.**

CLARENCE LODGE,

CLARENCE ROAD, CLAPHAM PARK.

A limited number of Ladies suffering from MENTAL and NERVOUS DISORDERS are received for treatment under a specialist. The house stands in large grounds.

For further Particulars see Illustrated Prospectus from the Proprietress,
Telephone: 494 Brixton. MRS. THWAITES, B.A.

MIDDLETON HALL,

MIDDLETON ST. GEORGE, near DARLINGTON, Co. DURHAM.

PRIVATE ASYLUM FOR THE CARE AND TREATMENT OF LADIES AND GENTLEMEN.

THE HOUSE, which stands amid well-wooded grounds, in a healthy and pleasant country in the valley of the Tees, has been recently erected from plans approved by the Commissioners in Lunacy, and embodies all the latest improvements in the construction of Homes for the Nervous and Mentally Afflicted. The building is **fire-proof**, and lighted throughout by Electricity, and the heating is aided by a system of steam pipes. Private sitting-rooms and special attendants are provided if required. Voluntary Boarders, not under certificates, can be received.

Terms to be had on application to L. HARRIS-LISTON, M.D., Medical Supt.

ESTABLISHED 1824.

The Retreat Private Asylum,

NEAR ARMAGH.

For the CURE and TREATMENT of Ladies and Gentlemen of the Upper and Middle Classes suffering from

MENTAL AND NERVOUS DISEASES.

Voluntary Boarders and Inebriates admitted without Medical Certificates.

This Retreat is beautifully situated in picturesque grounds of 150 acres, and Patients enjoy the greatest possible liberty. There is a large percentage of Recoveries on recent admissions.

For particulars apply to the Resident Medical Superintendent, Dr. J. GOWER ALLEN, J.P. or Mr. JOSEPH ALLEN.

FARNHAM HOUSE FOR CENTLEMEN || MARYVILLE FOR LADIES

FINGLAS, NEAR DUBLIN.

Private Hospitals for Patients of the Upper Classes suffering from NERVOUS and MENTAL DISEASES, ALCOHOLISM, Etc.

Telephone—Dublin 1470
Telegrams—"FINGLAS."

CONSULTING ROOMS: 41, UPPER FITZWILLIAM STREET, DUBLIN (*Telephone:* Dublin 2867).

THESE Establishments, which are healthily situated in pretty grounds upwards of 50 acres in extent, provide modern medical curative and palliative treatment on moderate terms. Voluntary Boarders admitted without Certificates. Large Staff maintained. Up-to-date sanitation.

Prospectus, forms, etc., on application to the Resident Medical Superintendent at the Institution; or at the CONSULTING ROOMS, from 3 to 5, Mondays, Wednesdays, and Fridays, or by appointment.

TUE BROOK VILLA,

LIVERPOOL, E.

PRIVATE ASYLUM for the **Care and Treatment of Ladies and Gentlemen MENTALLY AFFLICTED.** Voluntary Boarders also received without certificates.

For terms apply to: J. J. TISDALL, L.R.C.P. & S. *or* F. E. INGALL, F.R.C.S. Eng. } *Resident Medical Superintendents.*

West Sussex County Mental Hospital,

GRAYLINGWELL, CHICHESTER.

PRIVATE PATIENTS are received at low rates of maintenance—from One Guinea per week.

Illustrated Booklet and particulars supplied on application to—
The MEDICAL SUPERINTENDENT, Graylingwell Hospital, Chichester.

PRIVATE ASYLUMS.
CO. DUBLIN.

HAMPSTEAD, Clasnevin, for Gentlemen. | HIGHFIELD, Drumcondra, for Ladies.

For the Cure and Care of Patients of the Upper Class suffering from Mental and Nervous Diseases, the Abuse of Drugs, and Alcoholism.

Telephone No. 1032. Telegrams: "Eustace." Glasnevin.

These Hospitals are built on the Villa System, and there are also Cottages on the demesne (154 acres), which is 150 ft. above the sea-level and commands an extensive view of the Dublin Mountains and Bay.

Voluntary Patients admitted without Medical Certificate.

For further information apply for illustrated prospectus, etc., to the Resident Medical Superintendents: Dr. HENRY MARCUS EUSTACE, Highfield, Drumcondra, or Dr. WILLIAM NIELSON EUSTACE, Hampstead, Glasnevin; or at the Office, 41, Grafton Street, Dublin. Telephone 198. On Mondays, Wednesdays, and Fridays, from 2 to 3 p.m.

THE ROYAL ALBERT INSTITUTION
LANCASTER.

THE ROYAL ALBERT INSTITUTION is a Home for the Care, Education and Training of the IMPROVABLE FEEBLE-MINDED, with accommodation for 715 cases.

Terms: 1. FREE PATIENTS, between the ages of Six and Fifteen, whose friends cannot meet the lowest payment of 25 Guineas per annum.

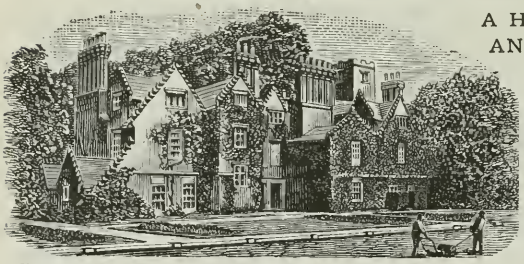
2. PAYING PATIENTS **admitted by the Central Committee without Election and at any time.** The charges vary from 25 to 200 Guineas per annum.

BRUNTON HOUSE (For Private Pupils).

BRUNTON HOUSE combines the comforts of a Private Home with all the advantages of a large Public Institution under responsible management. It possesses extensive gardens and grounds, which include tennis and croquet lawns. Individual attention is given to the pupils by an experienced Staff, under a Resident Physician and Lady Matron. SAMUEL KEIR, *General Secretary.*

THE MOAT HOUSE, TAMWORTH, STAFFORDSHIRE.

STATIONS: L. & N. WEST. and MID. RAILWAYS.



A HOME FOR NERVOUS AND MENTAL CASES.

The House stands in grounds of ten acres (within 5 minutes' drive of either Station), and is devoted to the care and treatment of a few Ladies suffering from Nervous and Mental Disorders, who enjoy the comforts, privacy, and occupations of home-life. Voluntary Patients are received without Certificates.

For terms, etc., apply to the Resident Proprietor,

E. HOLLINS, M.A. Camb., J.P.

DERBY BOROUGH ASYLUM.
FEMALE PRIVATE PATIENTS.

A SEPARATE and DETACHED BLOCK has just been opened. Terms: **One Guinea per week**, which includes everything except clothing. This Building is distinct from the main Asylum, and has separate recreation grounds.

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FULL PRESSURE IN 17 MINUTES.

MAW'S IMPROVED

High-Pressure Steam Sterilizer

FOR DRESSINGS.

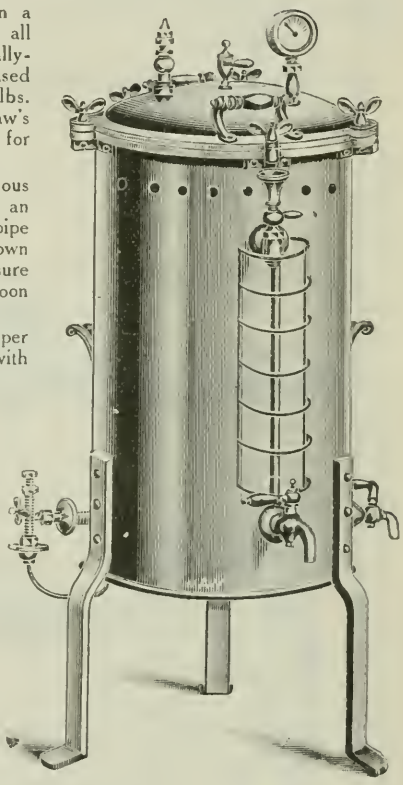
Regd. No. 585039.

The value of obtaining full pressure in a minimum of time will be appreciated by all Medical Men. By means of a specially-constructed bottom plate, giving increased heating surface, the full pressure of 5 lbs. can be obtained in seventeen minutes by Maw's Improved High-Pressure Steam Sterilizer for Dressings.

The objectionable way in which superfluous steam is blown off is entirely obviated by an ingenious arrangement fitting to the supply pipe by which the gas flame is automatically cut down to a mere spark as soon as the necessary pressure has been obtained, only to rise up again as soon as the pressure begins to fall.

Constructed of enamelled iron with copper interior and brass fittings, and furnished with one nickel-plated copper drum.

Fitted with Automatic Gas Control & specially constructed bottom plate.



PRICES.

No. 2	No. 3
19″ × 10″	19″ × 12″
£12 : 16 : 0	**£18 : 5 : 0**

The above measurements are the internal dimensions of the cylinder.

SPARE KETTLES.

Shallow Series (Four to each Sterilizer)
No. 2... **14/6** No. 3... **19/-**

Deep Series (Two to each Sterilizer)
No. 2... **18/-** No. 3... **22/-**

FULL PARTICULARS FROM

S. MAW, SON & SONS,

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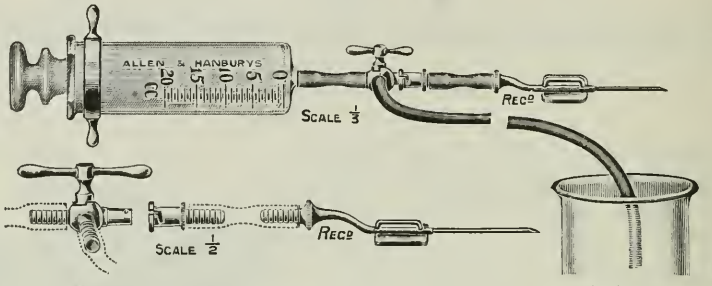
Telegrams: "Eleven, London" Telephone No. 3230 "London Wall" (4 lines).

Allen & Hanburys Ltd., Surgical Instrument Manufacturers.

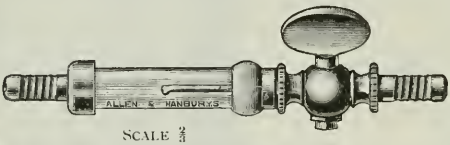
Salvarsan "606."



McDonagh's Intravenous Injection Apparatus - **12/6**
All-Glass Syringe for use with same - - - **10/6**

Illustrated Pamphlet sent free on application.

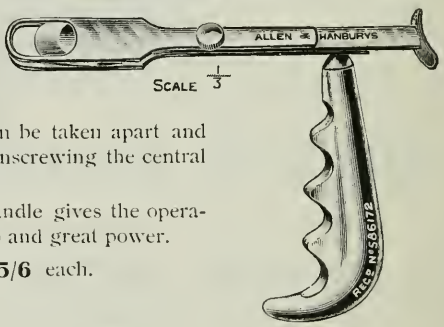
Saline Drop Regulator by E. CANNY RYALL.



The illustration depicts a simple device made to overcome the difficulty experienced in regulating the flow of Saline, more especially in Proctoclysis and Infusion. The inner metal indicating tube, with bulbous extremity, forms an emergency intravenous canula.

Price **4/6** each.

Aseptic Tonsil Guillotine (Registered Pattern).



ADVANTAGES.

1. The whole can be taken apart and sterilised by unscrewing the central screw.
2. The special handle gives the operator a firm grip and great power.

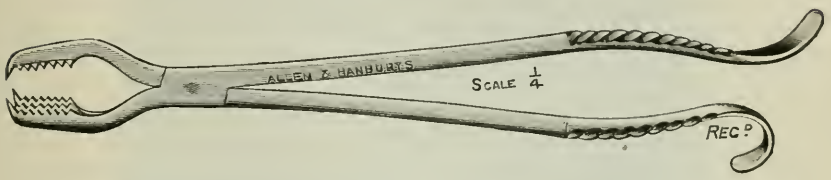
Price **25/6** each.

48, Wigmore Street, London, W.

Allen & Hanburys Ltd., Surgical Instrument Manufacturers,

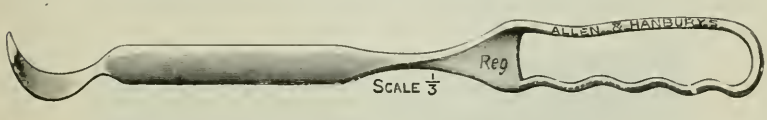
Arbuthnot Lane's Instruments for the Operative Treatment of Fractures

As made for Mr. Lane by ALLEN & HANBURYS Ltd.



Bone Holding Forceps, Lane's, latest improved pattern, *registered*, length 17½ in. - - - - - each **42/-**

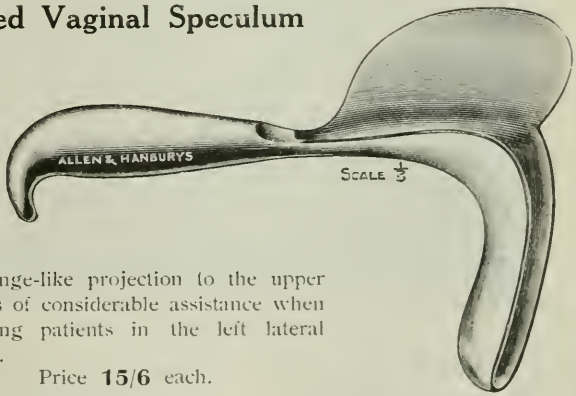
Ditto ditto ditto length 12 in. - - - - ,, **32/6**



Bone Elevator, Lane's, Retractor and Guard combined, *registered* - - - - - - - - each **12/6**

Improved Vaginal Speculum

By C. HUBERT ROBERTS, *F.R.C.S. Eng.*



The flange-like projection to the upper blade is of considerable assistance when examining patients in the left lateral position.

Price **15/6** each.

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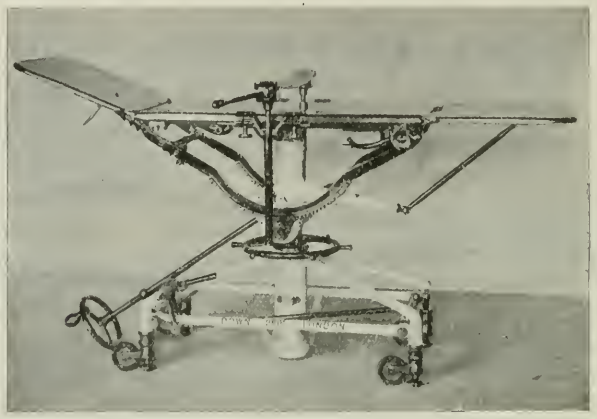
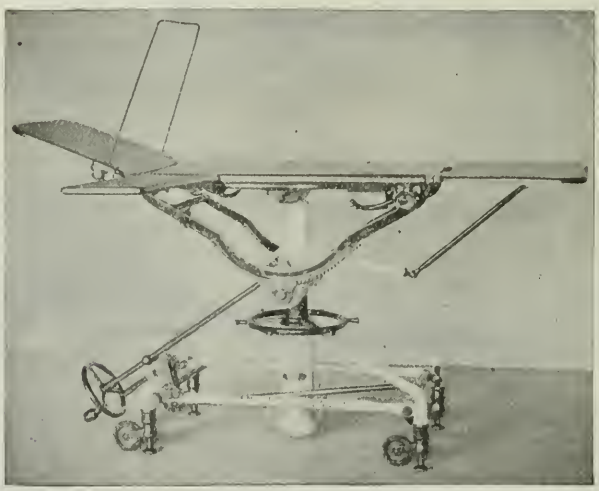
"UP-TO-DATE."

DOWN BROS.' New DENTATED QUADRANT MODEL OPERATION TABLE

(Made under Down Bros.' Patents) meets all requirements of Modern Surgery.



Ordinary position, showing windlass, and patent lever for throwing the castors in and out of action, and tubular taps for hot-water tank, also patent Lilienthal Bridge for kidney and gall-bladder operations, &c.



The "Up-to-date" Operation Table, with registered anæsthetic screen and hand-rest.

GRANDS PRIX:
PARIS 1900, BRUSSELS 1910, BUENOS AIRES 1910.

GOLD MEDAL
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DOWN BROS. LTD.
Surgical Instrument Makers,
21 & 23 St. Thomas's St., London, S.E.
(OPPOSITE GUY'S HOSPITAL).

Telegrams:	*Telephones:*
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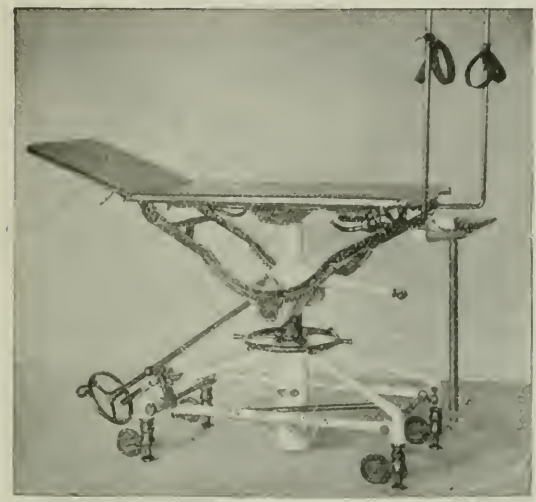
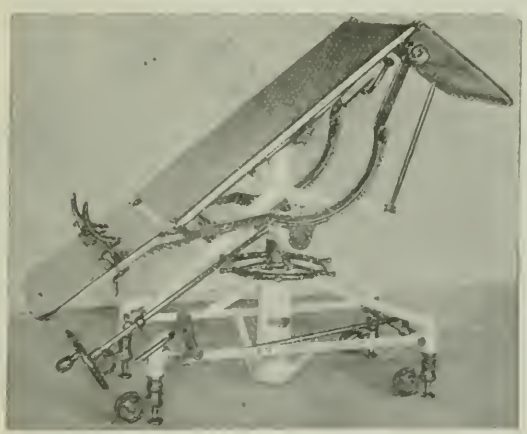
"UP-TO-DATE."

DOWN BROS.' NEW DENTATED QUADRANT MODEL OPERATION TABLE.



Showing the "Up-to-date" Operation Table, with Patent Leg Supports and fixing clamps and douching tray arranged for vaginal or rectal operations.



Showing the "Up-to-date" Operation Table, arranged in the Trendelenburg position, with Registered Shoulder Supports in position.

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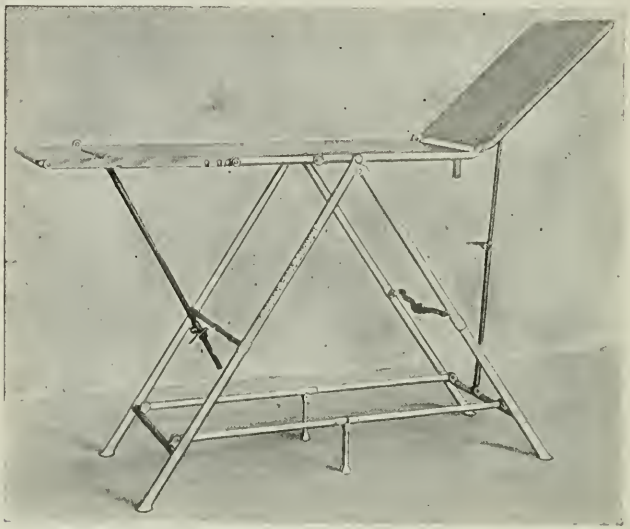
DOWN BROS.' PATENT PORTABLE ASEPTIC OPERATION TABLE.

Suggested by Mr. F. T. Paul, F.R.C.S., of Liverpool.



The Ordinary Position for Operating.

The Trendelenburg Position.

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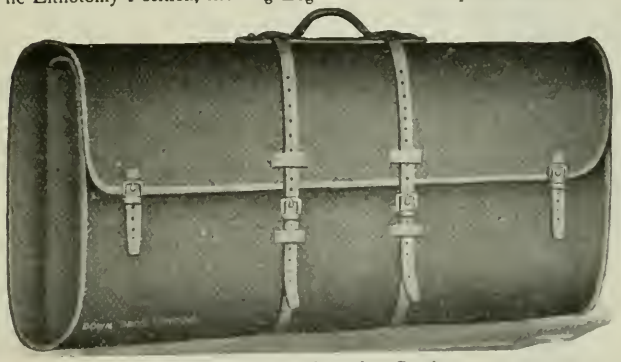
DOWN BROS.' PATENT PORTABLE ASEPTIC OPERATION TABLE.

Suggested by Mr. F. T. Paul, F.R.C.S., of Liverpool.

The Lithotomy Position, showing Leg-stems with Clamps and Footstraps.



Packed in Canvas Case for Carriage.

SIZE: Open, 70 × 18 × 36 in., Closed, 44 × 22 × 6 in. WEIGHT: 46 lbs., in Case 56 lbs.

PRICES:—Aluminium painted, **£13 13s.**, Nickel-plated (dull) **£15 15s.**

WATERPROOF CANVAS CASE, **£2 2s.** extra.

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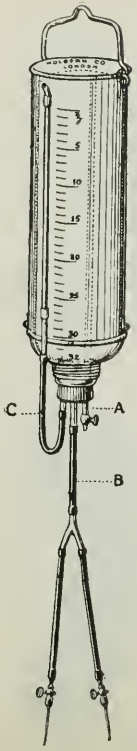


THE "HOLBORN"

Universal Saline Infusion Apparatus

(Subcutaneous).

Suggested by N. STUART CARRUTHERS, M.R.C.S. Eng., L.R.C.P. London.

Vide B. M. J., 30th Sept., 1911.—"The Inefficiency of the present method of Saline Infusion."

WE CLAIM THE FOLLOWING ADVANTAGES FOR THIS APPARATUS:—

It is of simple construction, easily put together, and inexpensive. The Solution remains hot in the vacuum flask for at least **6** hours. The amount infused is clearly shown by the water gauge and graduations at the side of the container. A uniform temperature can be maintained and the rate of flow controlled by means of the regulating taps.

Price complete, as illustrated - - £1 15 0

With Canny Ryall's Dropper and Rectal Tube for Continuous Proctoclysis, £2 2 0

Illustrated Circular post free on application.

The Holborn Surgical Instrument Co. Ld., London

An Intra-venous Ether Transfusion Apparatus

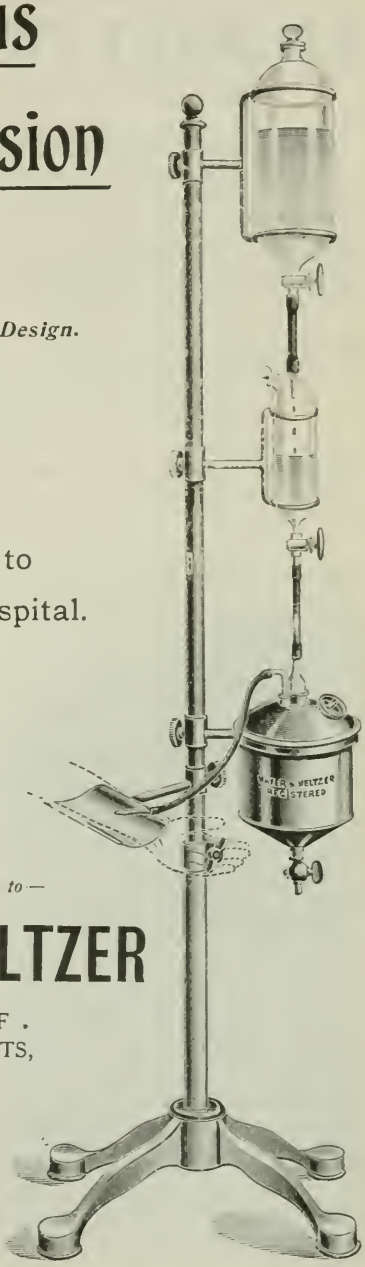
M. & M. Regd. Design.

* * *

Devised by
Dr. FELIX ROOD,
Assistant Anæsthetist to
University College Hospital.

* * *

See "British Medical Journal" October 21st, 1911.



Full Particulars on application to—

MAYER & MELTZER

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SURGICAL INSTRUMENTS,

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Clinical Urine Testing can be done as quickly as Clinical Thermometry when testing is done by means of

ENDOLYTIC TUBES.

Registered Trade Mark.

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The nickel Pocket Case which has become the twin companion in the pocket of the clinical thermometer, carries 20 tiny capillary tubes of reagent, one of which is used in each testing operation and is then discarded. Simply snap off the ends of a tube and dip one end in the urine vessel, when the urine is **attracted** into the tube containing the reagent, no suction being necessary. The operation is finished while the thermometer is registering the temperature, and the presence or absence of Albumen or Glucose is thus determined with the utmost ease and expedition. The reagents—Salicyl-Sulphonic Acid and Fehling's Solution—are the best of their kind and the **results** given are **conclusive**. The heat of a vesta flame or of boiling water completes Fehling's reaction.

"Ingenious and delicate means of clinically testing urine. They contain reliably prepared reagents. . . . The results were very plainly revealed."—THE LANCET.

THE URINE CAN BE TESTED AT THE BEDSIDE
IMMEDIATELY, CONVENIENTLY, AND DECOROUSLY.

PRICES :

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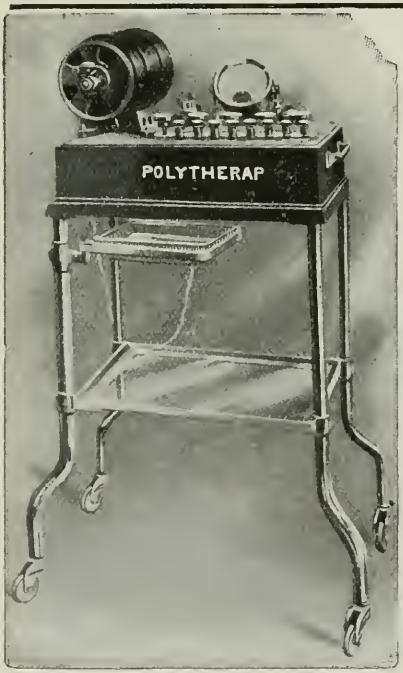

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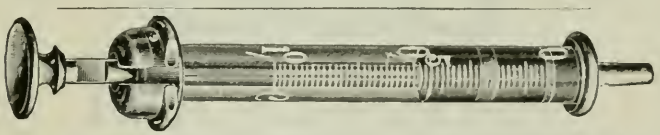

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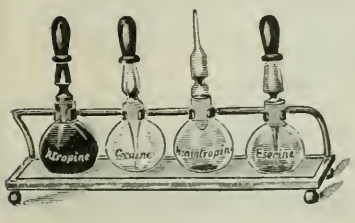

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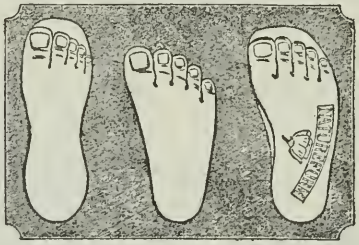

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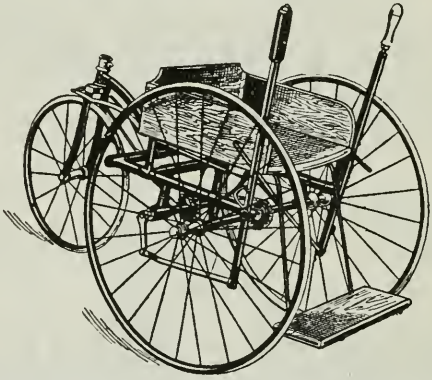

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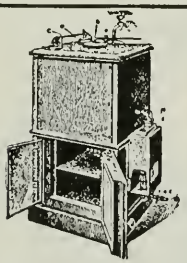

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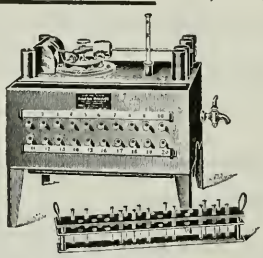

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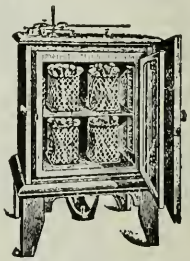

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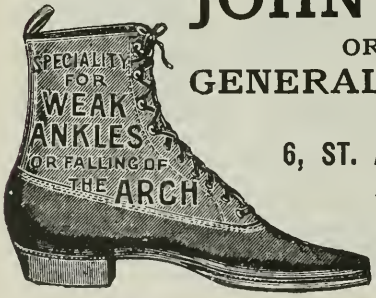

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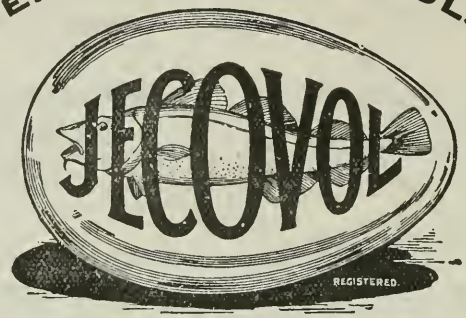

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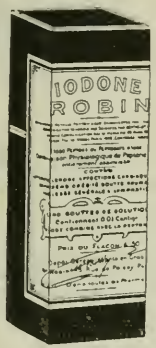

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